CHAPTER IV

DEVELOPMENT IMPLICATIONS OF TNC INVOLVEMENT IN AGRICULTURE

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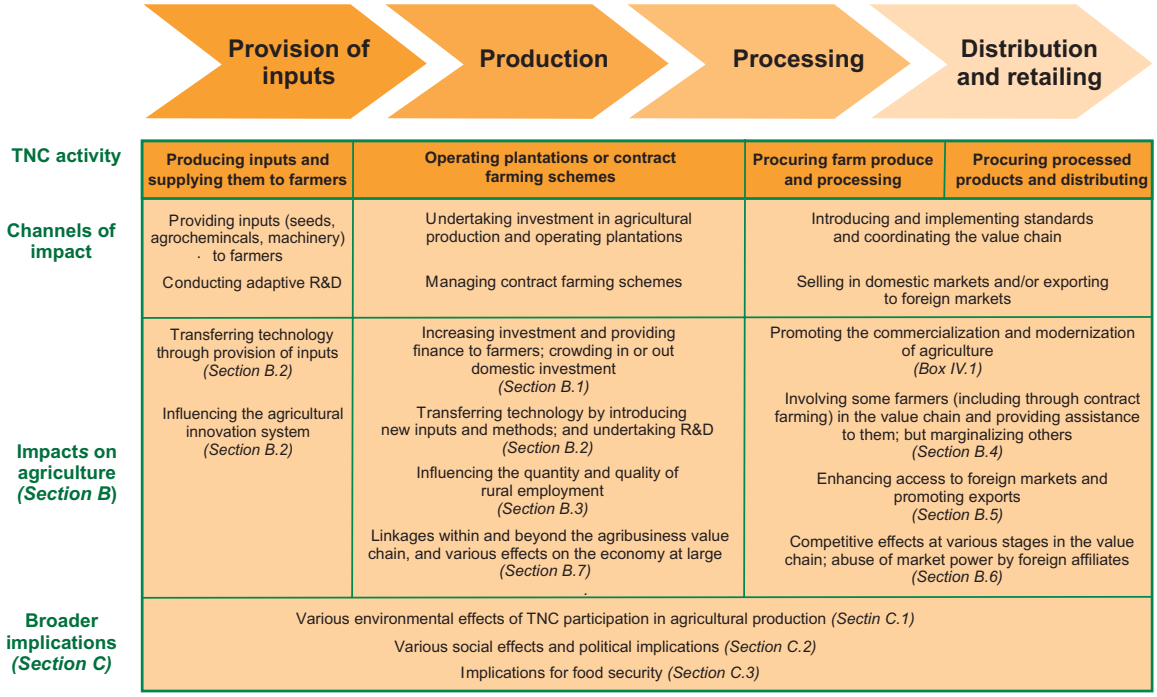
A. Introduction

Given the importance of agriculture for economies and societies, the impact and implications of TNC participation in the industry, especially in developing countries, are of considerable significance. This impact varies, depending partly on the nature of TNC participation, in particular whether the mode of involvement is FDI or a non-equity form such as contract farming (significant types and channels of impact are illustrated in figure IV.1). FDI in farming may have a positive effect on agricultural production and the host economy by providing financial resources, introducing new technologies, training workers, creating linkages with local input suppliers and encouraging – through example – the entry of other firms into the industry. Negative effects may result from TNC-run operations driving farmers out of business, for instance, with adverse consequences for employment and rural society. TNC involvement through contract farming can affect domestic agriculture via different channels, among others by providing local farmers with inputs such as seeds and fertilizers, and linking them to the global marketplace through their international supply chains. On the other hand, these links run the risk, for instance, of making farmers highly dependent on large and powerful companies.

In their international production activities, TNCs deploy a package of assets and resources that are useful for development, but are often in short supply or simply not available in host developing countries (chapter III). The challenge faced by a developing country is how to ensure that the ownership advantages possessed by TNCs in agriculture and agriculture-related activities can best contribute to its agriculture and the wider economy. There are potential synergies and beneficial effects to be gained from combining TNC advantages with underutilized agricultural resources – including labour and land – in developing countries, but there are also drawbacks. Some important questions therefore need to be borne in mind when assessing the impact of TNC participation in developing-country agriculture. For example, to what extent has TNC participation increased agricultural production and created value? To what degree has the value created in the host economy been retained domestically? And how has this retained value been distributed among various stakeholders, especially local farmers and the rural poor? In addition, against the backdrop of the current food crisis, what are the development implications of rising South-South FDI in food crop production?

Drawing on existing literature, as well as on a series of commodity and country case studies, this chapter examines the positive and negative impacts of TNC participation on agricultural development in host developing countries. The analysis focuses on the effects of their participation on agricultural production, but also considers the wider economic, environmental, and social implications for host countries. It takes into account the significance of contextual variables in determining the outcome of TNC involvement, including, for example, country/locational characteristics and endowments, the types of TNCs involved, their specific forms of participation, their stage in agribusiness value chains and the attributes of particular agricultural

Figure IV.1. TNC activities along agribusiness value chains and types of impact in host developing countries



Source: UNCTAD.

Note: The impacts and implications listed in the figure are discussed in the respective sections of chapter IV indicated in brackets.

products. For any specific agricultural operation with TNC involvement, the effects described in figure IV.1 are not necessarily attributable to TNCs. A major methodological challenge is therefore to isolate TNC-specific effects from more general ones; and the analysis needs to take into account the relevant alternatives and counterfactuals.

Bearing such issues in mind, section B of the chapter assesses the impact of TNC participation on agriculture production, looking at various areas of impact such as the provision of finance and investment, technology transfer and innovation, and foreign market access and exports. It also considers the overall impact on agriculture and wider economic implications. Section C addresses a number of environmental, social and political issues, taking into account factors related to sustainable agricultural development. Section D concludes, with particular attention to findings relevant for policy.

B. Impact on agricultural production in host developing economies

In developing countries, the involvement of TNCs in agricultural production, which is often linked to their participation in other parts of the agribusiness value chain, can intensify and accelerate the commercialization and modernization of agriculture (box IV.1). These processes influence, in varying degrees, all aspects of TNC impact on agricultural production examined in this section.

1. Financing and investment

a. Contributing capital and increasing investment through FDI

As TNCs in agriculture-related activities focus on their core competencies and undertake only limited FDI in agricultural production, their contributions to overall capital inflows to agriculture in developing countries are small (chapter III). However, when agricultural FDI is compared to total investment or value added in agriculture in a host country (a more appropriate comparison than that to overall FDI), or, even better, to private investment in agriculture, it shows that the share of such FDI can be quite significant in some cases.

Overall, the ratio of FDI to gross capital formation (GCF) in agriculture in developing countries is small, at 1.1%, compared with a ratio of 12.7% for total FDI inflows to total GCF of developing countries in 2007.[1] Nevertheless, there are several developing

Box IV.1. TNC participation and the commercialization and modernization of agriculture in developing countries

The shift from subsistence to commercial farming is an integral part of the overall process of modernization of agriculture in developing countries. By helping expand production, enhance efficiency and release labour from agriculture, the commercialization of farming underpins the role of agriculture in economic development.

Commercialization is a process that takes place with or without TNC involvement. However, the participation of agribusiness TNCs can accelerate the process of commercialization, for example by favouring farming operations that are specialized, large-scale, and capital- and knowledge-intensive. Moreover, in order to comply with the requirements of agribusiness TNCs, farmers have to become more responsive to market trends and requirements, with a strong emphasis on delivery, quality and other specifications and standards. In practice, this means that not only do local farms need to invest in physical capital (e.g. storage and transport facilities, irrigation systems), but they also have to adopt modern business practices (e.g. managing financial flows, meeting various standards and traceability requirements) and improve logistics. In this respect, agribusiness TNCs play an important role in modernizing agriculture in host countries. However, their participation can also have negative consequences which need to be addressed, such as the decline of small-scale farms and unfavourable effects on the environment.

Source: UNCTAD.

countries, in which the share of FDI relative to domestic agricultural investment is much higher than the average for all developing countries (table IV.1). China and Viet Nam are examples of two countries that have included agriculture among their priority areas for attracting FDI, and, unlike some other developing countries which also do so, they have managed to attract significant amounts of such investment. This has made a distinct difference to their agriculture, not only in terms of capital and investment, but also, for example, by way of upgrading productivity and exports (boxes IV.2 and IV.3).

As noted in chapter III, there are many agriculture-related TNCs that engage directly in agricultural production in host developing countries, provided that those countries manage to reduce risk factors and create a more conducive environment. In addition, new investors are emerging, such as TNCs from developing countries and private equity funds, and some of their actual and proposed investment projects are very large (chapter III). As more developing countries seek to promote agricultural FDI, it can be expected to help raise investment levels in agriculture in these countries.

In addition to their direct impact on investment, TNCs can indirectly influence investment levels in host-country agriculture through their effects on investments of domestic entities. These effects vary: the direct participation of TNCs in agricultural production may substitute for domestic investment; but it may also "crowd in" other investors through demonstration and/or spillover effects. Domestic private investment is always important for agricultural development, but FDI can play a complementary role, both by increasing the total amount of investment, as noted above, and by directing investment to preferred areas such as the production of high-value-added crops, as discussed in the following sections. Nevertheless, the importance of public investment in agriculture needs to be emphasized, as it helps pull infrastructure into rural areas, empowers small farmers, and provides an enabling environment for private investment.

b. Easing financial constraints through contract farming

While FDI accounts for a relatively small share of capital inflows and agricultural investment in most developing countries, an important form of TNC involvement is contract farming. This form

Table IV.1. FDI in agriculture in selected major host developing countries: ratios of FDI inflows to GCF and of FDI stock to GDP, in agriculture and in the entire economy, 2007
(Per cent)

	FDI inflows in GCF		FDI stock in GDP	
	Agriculture	Economy	Agriculture	Economy
Country	2005–2007[a]	2007	2007	2007
Average of developing countries	1.1	13.1	..	29.7
Malaysia	21.9	20.6	..	41.0
Cambodia	19.1	51.9	..	44.2
Guyana	15.1	57.9	..	117.4
Honduras	9.2	21.8	..	34.3
Costa Rica	8.1	33.1	..	34.0
Fiji	6.7	45.8	..	44.1
Tanzania, United Rep. of	6.1	17.7	..	41.0
Lao PDR	5.7	19.6	..	28.3
Mozambique	5.5	23.1	..	41.5
Ecuador	4.9	2.0	..	23.2
Chile	4.0	38.4	19.7	60.7
Brazil	3.9	14.8	..	23.2
Viet Nam	1.5	25.5	17.6	56.6
China	0.5	6.0	18.6	9.7
Morocco	0.1	12.2	14.6	52.6
Namibia	..	35.3	16.4	43.6
Papua New Guinea	..	8.5	9.2	36.7

Source: UNCTAD, based on UNCTAD, FDI/TNC database and data provided by the United Nations Statistical Office.

[a] Or latest three-year period available between 1999 and 2006.

of involvement can have a very important impact on agriculture in developing countries, in particular by helping to ease financial and other investment constraints on local farmers, who might otherwise lack access to financial services. Indeed, despite the expansion of financial services for agriculture, they are still inaccessible to a majority of smallholders worldwide (World Bank, 2007).[2]

Banks and other financial institutions have not filled the gap, because they tend to focus on urban areas, where there is a higher concentration of potential clients (businesses and households), and where clients are relatively more affluent, operating costs are lower and contract enforcement is easier than in rural areas. Where finance in rural areas has been available (often through informal service arrangements such as money lenders, pawnshops or families), it has normally been directed at larger farms, so that most small producers have been excluded from the credit system.[3] In this context, the emergence of vertically coordinated supply chains (chapter III) – domestic and/or international – and contract farming, often run by TNCs in segments of the value chain upstream or downstream from production, has in many cases facilitated financial intermediation for farmers, including smallholders, who have been able to link up with these chains.

Contracts, especially with large, reputable TNCs, can ease financial constraints for participating local farmers in developing countries in a number of ways:

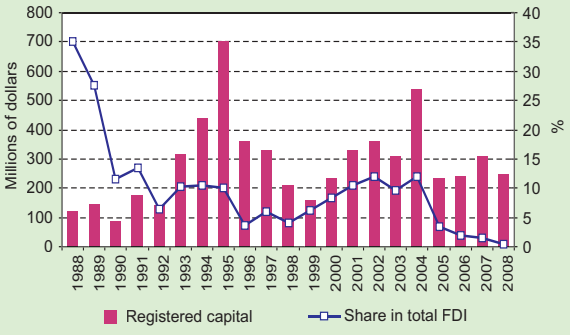
- Contract farming usually facilitates farmers' access to credit to finance production inputs and/or investment. In most cases it is contractors who advance such credit (Eaton and Shepherd, 2001). Agribusiness firms have an advantage over banks as lenders in such circumstances, because of their ability to monitor and enforce credit contracts (Key and Runsten, 1999).[4] Their contracts with smallholders usually include forward payments or provision of inputs to help overcome the problem of financial constraints faced by these farmers (Simmons, 2003).
- Some bank managers consider contracts with large agro-industry firms as a substitute for collateral, and on this basis, provide credit to smallholders, which otherwise would not have been possible (Reardon and Swinnen, 2004). In other cases, where banks or government agencies do not advance credit without guarantees, the sponsors of contracts make the necessary arrangements for credit, with the contract serving as collateral (Eaton and Shepherd, 2001). This is particularly

Box IV.2. The contribution of FDI to agriculture in Viet Nam

For many years, Viet Nam has offered a variety of incentives to promote FDI in agriculture. During the period 1988–2008, the country registered 719 FDI projects in agriculture, forestry and fishing worth $4.2 billion of total registered capital (box figure IV.2.1). These projects accounted for 7% of the total number of registered FDI projects and for 3% of the total registered FDI capital. But the implementation of licensed projects is much lower, and as a result, FDI stock in agriculture was $1.7 billion in 2007 (annex table A.III.1). If the stock is compared with value added in agriculture or the estimated private investment in Viet Nam's agriculture during the period 1988–2007, then the contribution of foreign investment becomes very significant: 18% and 28% of the total respectively. Most of this FDI originates from Asian developing economies, with Taiwan Province of China being the largest source, accounting for a quarter of the country's FDI stock in agriculture.

Apart from bringing much needed capital to Viet Nam's agriculture and contributing to the expansion of production capacity, FDI projects have increased productivity through the transfer of advanced technology and the competitiveness of agro-forestry produce. The Government is continuing in its efforts to improve the investment climate in agriculture in order to sustain FDI inflows, the significance of which fell in recent years. It hopes to raise the level of implementation of registered FDI projects and promote not only resource exploitation, but also FDI in high-value-added activities. The Ministry of Agriculture has initiated a programme for 2008–2015 aimed at addressing bottlenecks to TNC participation.[a]

Box figure IV.2.1. FDI in agriculture in Viet Nam, registered capital and share in total FDI, 1988–2008



Source: Foreign Investment Agency Viet Nam.

Source: UNCTAD, based on Truong (2009).

[a] Viet Nam, Foreign Press Center, "Foreign investment in agriculture remains limited", 18 December 2008 (www.presscenter.org.vn).

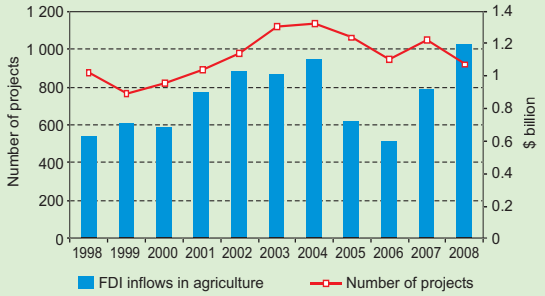
Box IV.3. The significance of FDI in China's agriculture

China has received significant inflows of FDI in agriculture since 1998: they ranged from $600 million to over $1.2 billion annually between 1998 and 2008 (box figure IV.3.1). During the entire period, China registered 10,622 FDI projects in agriculture (or 3% of the total number of FDI projects) and nearly $10 billion of cumulative FDI inflows (or 1.5% of total accumulated inflows).

Significant FDI to agriculture in the country supplements domestic capital for investment, brings advanced technologies and equipment, introduces new products and advanced management, promotes development of the food processing industry, and accelerates reform in rural areas and in agriculture in general (Ge, 2009).

Source: UNCTAD.

Box figure IV.3.1. FDI in agriculture in China, inflows and number of projects, 1998–2008



Source: Ministry of Commerce of China.

important when farmers have to make substantial investments (e.g. in heavy machinery).

- Participation in contract farming strengthens the credit and investment capabilities of farmers by increasing their income. Contract farmers have significantly higher incomes than other farmers: from 10% to as much as 100% higher in Guatemala, Indonesia and Kenya (World Bank, 2007). In two cases of contract farming examined in India, one concerning milk and another vegetables, revenues of farmers were two to four times higher than those of non-contract farmers (Birthal, Joshi and Gulati, 2005). Indeed, most empirical studies suggest that contract farming schemes have raised the income of participating farmers (e.g. Little and Watts, 1994; Porter and Phillips-Howard, 1997; Minot, 2007).

On the other hand, participating farmers can come under considerable financial pressure when dealing with large agribusiness firms. It is common practice by companies such as supermarkets to delay payments to suppliers; for example, in Latin America, horticultural producers face payment delays of 15 to 90 days (Reardon and Berdegué, 2002).

While the provision or facilitation of access to finance for local farmers through contract farming is common, data concerning the amounts involved are difficult to ascertain. Sometimes, for an individual farmer these amounts are relatively small, but they can make a big difference (Setboonsarng, 2008), as illustrated by Olam Nigeria's support to rice farmers (box IV.4). Other examples indicate that the amounts can be significant. For example, Bunge, a United States agribusiness TNC, provided the equivalent of nearly $1 billion worth of inputs to Brazilian soya farmers in 2004 (Greenpeace, 2006). Overall, United States TNCs are responsible for 60% of the total financing of soya production in Brazil (Milieudefensie and Friends of the Earth, 2006).[5]

2. Technology and innovation

Technological progress is crucial for agricultural development. Throughout the twentieth century, improvements in agricultural productivity were closely linked to policies towards and investments in agricultural R&D (Alston, Pardey and Smith, 1999). Agricultural development through innovation is vital for reducing poverty in the developing world, but agricultural R&D remains concentrated in developed countries and is grossly underfunded in most developing countries (IAASTD, 2008). Due partly to weaknesses in their agricultural innovation systems, developing countries as a whole invested only 0.56% of their agricultural value added in R&D in 2000, compared with 5.16% invested by developed countries (Pardey et al., 2007).

Public research programmes have in the past produced important results, including scientific and technological breakthroughs.[6] They contributed to the "Green Revolution", the first wave of agricultural technology development in the developing world, in which an explicit strategy for technology development and diffusion targeting poor farmers in low-income countries made improved technologies freely available as a public good (Pingali and Raney, 2005). However, total public spending on R&D has slowed down significantly in developing regions in the past decade or so (chapter III). This has widened the knowledge divide between developing and developed countries, and, within the developing world, between a handful of "star performers" (e.g. Brazil, China, India and Malaysia) and most of the others (World Bank, 2007; chapter III). In the meantime, the locus

of global agricultural R&D has shifted from the public sector to TNCs, driven by some interrelated technological and institutional forces.[7] Coupled with the transition in plant improvement research, from (conventional) breeding to molecular approaches, TNCs have been leading a "Gene Revolution", a second wave of agricultural technology development, in which improved agricultural technologies flow to developing countries primarily through market transactions (Pingali and Traxler, 2002).

Given their increased importance in agricultural innovation, TNCs can play a role in narrowing the above-mentioned knowledge gaps, both by transferring new technologies to developing countries (section B.2.a) and by engaging in local R&D activities (section B.2.b). However, the concrete technological contributions of TNCs have been limited, varying greatly by product and country. They are significant in the production of certain commercial crops in some developing countries, but remain marginal in most low-income countries for many important agricultural products, especially food staples. In addition, TNC involvement in agricultural production in developing countries has given rise to concerns that the technologies used or transferred by foreign companies may not be the most suited to these countries, and that it may have made local farmers overly dependent on specific technologies provided by TNCs.

a. TNC participation and technology transfer

Developing countries can improve agricultural productivity by acquiring advanced technologies from developed countries, but a number of factors related to the creation and dissemination of agricultural technology have significantly limited the benefits they have reaped from technology transfer.

- First, R&D by TNCs tends to focus on commercial crops with relatively large markets. No serious investments have been made in developing genetically modified (GM) seeds of importance to the poorest arid countries, and only 1% of TNCs' R&D budgets has been spent on crops that might be useful for the developing world (Pingali and Traxler, 2002; United Nations, 2004). The benefits remain limited for countries in sub-Saharan Africa, in particular, where crops grown "are more diverse, with many so-called orphan crops where there is little global public or private R&D" (World Bank, 2007: 168).
- Second, technologies created by developed-country firms may not be suitable or beneficial to developing countries, as their utilization is often constrained by geographical and climatic conditions. Therefore, the transfer of agricultural technology is more constrained than that of industrial technology (Hayami and Ruttan, 1985;

Box IV.4. Easing financial and other constraints on rice farming and processing in Nigeria

For many years, Olam Nigeria, a foreign affiliate of a Singapore-based agriculture-related TNC (box III.10), has been an importer of rice. Although Nigeria has suitable conditions for rice cultivation, local production does not satisfy the demand. A major reason is low productivity because farmers cannot afford expensive inputs (e.g. high quality seeds and fertilizers) for meeting standards of quality. Moreover, smallholder farmers are unable to get credit from the banks, which consider them "unbankable". Difficulty of access to markets due to lack of transport, poor and insecure roads and the lack of reputable buyers, is another problem. Consequently, the country imports nearly 60% of rice to meet local demand, making Nigeria the largest importer of rice in Africa and the second largest in the world.

Taking advantage of high import tariffs on milled rice, in 2005 Olam leased a mill from the Government and began processing locally produced rice. By 2007, the company had invested $5 million in upgrading the mill and had doubled its capacity. To solve the problem of an insufficient supply of high quality rice, in 2006 Olam started an outgrowers programme for rice cultivation in Nigeria, in partnership with, and the encouragement of, the United States Agency for International Development (USAID).

Initially, Olam provided credit to farmers to buy seeds and fertilizers. It also encouraged a Nigerian commercial bank, First Bank, to establish a commercial credit programme for smallholder farmers amounting to $5 million. This was made possible because of Olam's backing and the Central Bank of Nigeria serving as a guarantor. During the first two years, 8,000 farmers participated in the programme, and participation is expected to grow to 20,000 farmers by the end of 2009. Equipped with credit, smallholder farmers have been able to buy inputs from Olam, including certified herbicides, crop protection chemicals, fertilizers and sprayers. The buy-back provisions allow Olam to buy the rice at above-market price at the farm gate, transporting it for free to the mill. USAID has provided, among others, a model farm that is used for training and capacity-building for obtaining higher yields and better quality, and cooperatives have been formed to bundle rice and negotiate prices. Farmers, having gained their first-ever access to credit and a reliable buyer, have seen their incomes rise.

Source: UNCTAD, based on various online sources from USAID.

Sachs, 2001). Without adaptive research, it is usually difficult to transfer advanced technologies produced in developed countries that are mostly in temperate zones, to developing countries, many of which are in tropical zones (Johnson and Evenson, 2000; Gutierrez, 2002).[8]

- Third, barriers to international trade and investment in agricultural industries, as well as institutional asymmetries between developed and developing countries (e.g. in terms of agricultural systems and market institutions),[9] make the channels of technology transfer frequently dysfunctional or inefficient. For instance, regulatory obstacles in many developing countries hamper the transfer of agricultural technologies (Gisselquist and Grether, 2000). Moreover, an increasing proportion of new agricultural technologies are protected by intellectual property rights (IPRs) in developed countries, which limits developing countries' access to them and poses a major challenge for their use to benefit the poor (chapter V).

Due to these factors, expectations regarding the technological contribution of TNCs to agricultural development cannot be high. Nevertheless, as the following analysis highlights, there are areas where TNCs can make a contribution. Evidence from case studies shows that, apart from the traditional modes of international technology transfer related to international trade,[10] the direct and indirect participation of TNCs in production provides additional, and perhaps more effective, ways of transferring technologies. The involvement of different types of TNCs, including seed companies and other input providers, plantation companies and food processors, can bring a variety of useful technologies that may not otherwise be locally available. These technologies include, for instance, new farming methods, knowledge for enhancing production, soil and water management know-how, and various technologies intrinsic to inputs such as seeds, agrochemicals and machinery.

TNC participation in agricultural production through FDI. Utilizing their ownership advantages in technology (chapter III), TNCs participating in agricultural production through FDI introduce a range of hard and soft technologies that contribute to increased output and enhanced productivity. In the cut flower industry in many African and Latin American countries, foreign-owned farms have contributed to higher efficiency and productivity by adopting new technologies at various stages of the cut flower value chain (Wee and Arnold, 2009).[11] In Asia, foreign-invested projects in some agricultural crops have brought in more effective, sophisticated or advanced varieties, techniques and equipment, helping to improve productivity in countries such as China (box IV.5). In Viet Nam, significant technology transfer has occurred in foreign-invested projects in sugar production, vegetable and fruit planting and processing, and reforestation, including the introduction of various high-yield plant and animal varieties. In Africa, high-yielding varieties of cereals have been introduced by TNCs, leading to higher productivity. For example, China State Farm and Agribusiness Corporation (CSFAC) collaborated with the China Hybrid Rice Engineering Research Centre in introducing high-yielding hybrid rice to African countries such as Guinea.[12]

However, FDI in the industry has not always resulted in technology-related productivity gains, partly due to the fact that technological innovation in agriculture often occurs in discontinuous steps with perhaps long intervals of little or no change in between. For example, in the global banana industry in which TNCs play an important role in distribution as well as production (chapter III), no significant innovations took place during the 1980s, leading researchers to believe – erroneously – that there was little hope of productivity increases and cost reductions (FAO, 1996).[13] Moreover, technology transfer to TNC-owned farms does not readily diffuse to local producers, and nor is this usually in TNCs' interest.

TNC participation in agricultural production through contract farming. Under contract farming arrangements, agricultural TNCs normally provide

Box IV.5. Foreign investment and technological progress in agriculture in China

Foreign investment in agricultural production projects in China has introduced more than 100,000 copies of animal and plant germplasm resources, and a large number of advanced and practical technologies. Examples of significant technologies include: plastic film mulching technology, dry rice planting technology, agricultural remote sensing technology, straw ammoniation technology, and fresh fruit and vegetable processing technology. The plastic mulching technology has been utilized in nearly 100 crops.

In rice production, dry rice planting technology has been extended to more than 10 provinces, covering an area of 13 million hectares. New equipment has also been introduced. For instance, a joint venture established between Satake (a Japanese manufacturer of machinery for rice and other food products), Mitsui (a Japanese trading company) and a local company has engaged in rice contract farming in Jilin since 1998, using advanced rice mill technology.

Source: UNCTAD, based on China, Ministry of Agriculture (2004) and information provided by the Ministry of Commerce of China.

local farmers with technical assistance, seeds, fertilizers, as well as other inputs in which technology and know-how are embedded. In addition, they have a strong interest in providing effective extension services in order to obtain high-quality, low-cost products. Therefore, TNCs can support local farmers in contract farming schemes to overcome technological barriers in order to orient their production towards higher value-added, more knowledge-intensive agricultural products, and accordingly increase their revenues and income. However, technology transfer through contract farming takes place more frequently in the production of high-value-added crops and varieties which attract greater TNC involvement, than in the production of traditional food crops.

Through contract farming, foreign affiliates in the food processing and trading industries have helped transfer new plant varieties, equipment and practices to their local suppliers, primarily farmers. For instance, field research conducted by UNCTAD in 2001 revealed that leading foreign affiliates in India's food industry had contributed significantly in this regard.[14] For example, Pepsi supplied its contract farmers with various agricultural implements and hybrid seeds/plantlets, free of cost, as well as process know-how. Cadbury India has a procurement and extension services team that provides training to potential and existing suppliers on new techniques in planting, harvesting, quality control and post-transplantation care of crops (*WIR01*). In Nigeria, Olam (Singapore) provides farmers with all inputs, including certified herbicides, crop protection chemicals, fertilizers and sprayers, and the foreign affiliate runs a model farm for capacity-building seed multiplication (box IV.4).

Through their involvement in contract farming and transfer of technology to host countries, TNCs in food processing and trading can induce productivity upgrading and yield increases. Sometimes these effects can be significant. For example in India's state of Punjab, prior to TNC entry in 1989, the tomato yield was 16 tons/hectare; by 1999, the yield of suppliers to foreign processing affiliates had increased to 52 tons/hectare, partly as a result of this relationship (*WIR01*). Similarly, a study of a foreign-involved contract farming operation in the north of India demonstrated that yields of tomato farmers under contract were 64% higher than those of farmers who were not (Eaton and Shepherd, 2001; Bruinsma, 2003).

Involvement of foreign seed companies as well as other input providers. TNCs can also play an important role in bringing to local farmers useful technologies that are embedded in products such as seeds, agrochemicals (fertilizers and pesticides) and machinery.[15] The seed industry in the developing world was started by TNCs from developed countries, and then led to the emergence of local firms (Morris, 1998). In particular, the economic viability of hybrids has resulted in a rapid development of the seed industry in developing countries, and the industry has expanded even in low-income countries. In Uganda, for example, 14 major seed companies have local affiliates, among them Monsanto, which deals in hybrid maize that has helped increase yields significantly (Nsonzi, 2009). All the seeds Monsanto supplies in Uganda can be replanted. However, in some other cases, seeds provided by TNCs cannot be replanted, and farmers cannot set aside seeds for planting in the next season, which means they have to buy them from suppliers. This has led to concerns about the dependence of local farmers on specific inputs provided by TNCs.[16]

Although TNCs' investments in genomics and genetic engineering could be useful for addressing the problems faced by poor farmers in developing countries, their potential has not been realized. This is partly because of the necessary ongoing debate about the long-term impacts of GM crops on the environment and human health (section C.1). Developed countries (mainly the United States and Canada) accounted for a major share of the estimated 125 million hectares of GM crops grown globally in 2008 (James, 2008). Only 6 developing countries, namely Argentina, Brazil, China, India, Paraguay and South Africa, have planted more than 1 million hectare of GM crops; and only 3 African countries have ever planted such crops.

b. TNC participation and the agricultural innovation system in host countries

As noted above, adaptive R&D is often needed in order for TNCs to transfer advanced technologies created in developed countries to their operations in developing countries. In addition, sometimes foreign affiliates conduct location-specific research on crops, soil and water, and for developing more sustainable and resilient agricultural systems. Until recently, however, these kinds of activities were limited to a few developing countries and selected crops.

An *agricultural innovation system* is characterized by its very diverse composition, including players such as public research institutes, private enterprises (domestic or foreign), farmers and various government agencies and regulatory bodies. When they engage in R&D activities locally, TNCs become players in the system and influence its effectiveness and performance in a number of ways:

- First, their spending helps increase agricultural R&D in developing countries, as for example in India (box IV.6). In Latin America, some international seed and agrochemical producers,

such as BASF, Dupont, Monsanto, Novartis, Pioneer and Syngenta, actively conduct agricultural R&D, as do TNCs such as Chiquita, Del Monte and Dole (Stads and Beintema, 2009). In China, Syngenta has established four seed research and demonstration facilities and a technical centre for crop protection, and its sixth global R&D centre was set up in Beijing in 2008.[17]

- Second, TNC involvement in agricultural R&D increases the significance of the private sector in the sectoral innovation system. A common weakness of the innovation system in developing countries, particularly in agriculture, is the absence of a sufficient number of innovative enterprises (*WIR05*).[18] In Latin America, for instance, the public sector does most of the R&D in agriculture; most domestic private companies outsource their research to government agencies or universities, or they import technologies from abroad (Stads and Beintema, 2009). However, in a number of Latin American countries, such as Argentina and Brazil, and Asian countries, including China, India, Malaysia and Thailand, foreign investors have made an important contribution to private research in agriculture, though the total amount is still small (Pray and Fuglie, 2001).
- Third, TNC participation creates opportunities for learning and channels for knowledge spillovers, and it links local entities to global innovation systems. For instance, as many public research institutes in developing countries face institutional constraints that inhibit their effectiveness and thus their ability to attract funds, they can benefit from knowledge spillovers from TNCs and activate their underutilized innovative potential by conducting adaptive, commercially-oriented R&D. Several types of international public-private partnerships (PPPs) can be developed between public research institutes and TNCs (box IV.7), and government policies in developing countries can play an important role in fostering such partnerships (chapter V).

At the same time, agricultural R&D undertaken by TNCs locally may trigger concerns in host developing countries. The potential costs of TNC involvement in the agricultural innovation system for a host developing country depend mainly on the type of R&D and TNCs' motives, as well as on the strength of the domestic innovation system. Major issues of concern relate to the potential downsizing of domestic R&D, the narrow scope of R&D activities (focusing too much on short-term commercial interests), unfair sharing of intellectual properties resulting from local R&D and related revenues, and possible technology leakage. A related concern is that the knowledge created by TNCs in cooperation with local institutions may be used by the TNCs in other markets, thereby enabling them to cream off the returns. Another concern is that foreign research affiliates might become "gene pirates" if they transfer domestic-specific germplasm resources abroad and utilize them commercially for international markets. Policymakers in host developing countries therefore need to consider the protection of their particular gene resources as well as the IPRs of TNCs (chapter V).

For low-income countries, small-scale farmers' limited access to new technologies has always been a problem for technological progress in agriculture. Traditional extension services often have limited outreach, while local producers have restricted access

Box IV.6. TNCs and the agricultural innovation system in India

India has one of the largest and most complex and institutionally diverse agricultural innovation systems in the world. The system is characterized by a proactive government policy, coupled with support from a number of bilateral and multilateral donors. It has achieved many successes, most notably the Green Revolution in the 1960s and 1970s (Evenson, Pray and Rosegrant, 1999). To achieve a more complex and expanding research agenda, the Indian Government has involved TNCs in the system since the early 1990s. In 1991, the Government allowed seed imports and majority foreign ownership of seed companies, which resulted in a number of foreign seed companies entering the market and undertaking R&D locally (Pal and Byerlee, 2006).

In a dynamic system of innovation, various players operate in partnerships, networks and consortia, and various forms of public-private partnerships (PPPs) may emerge (Hall, 2009). The various forms of partnership between domestic and foreign entities in India's agricultural innovation system have created opportunities for learning and channels of knowledge spillovers from TNCs to local entities, including public research institutes, domestic enterprises and farmers. For example, in the area of biotechnology, all Indian companies with significant R&D programmes have established joint ventures with global companies for access to their proprietary tools and technologies (Pal and Byerlee, 2006). In the food processing industry, the four largest foreign affiliates (Pepsi Foods Ltd., GlaxoSmithKline Beecham Ltd., Nestlé India Ltd. and Cadbury India Ltd.) are engaged in product development with local research institutes or universities to develop hybrid varieties of crops and vegetables and new agricultural implements to alter cropping patterns and raise productivity (*WIR01*).

Source: UNCTAD.

Box IV.7. International public-private partnership between public research institutes and TNCs: the case of Embrapa in Brazil

Established in 1973, Embrapa is the leading public agricultural research institute in Brazil. It has established several types of domestic and international partnerships with TNCs:

- *Partnerships with TNCs for the development of new technologies.* In this kind of partnership, Embrapa and its partner develop R&D projects together, and the resulting technology is then made available for broader local use. For example, BASF and Embrapa signed a technical collaboration agreement to create cultivars resistant to herbicides. These cultivars will soon be available in the market.
- *Partnerships for incorporating technologies from other corporations into Embrapa products.* This type of agreement enables Embrapa to identify and license technologies from other organizations, and incorporate them into its own products. It helps the R&D process and facilitates technology transfer. Some TNCs and technologies involved are, for example, BASF (herbicide resistance) and Monsanto (resistance to glyphosate-based herbicide).
- *Partnerships where Embrapa provides licences of its technologies to TNCs.* In this type of partnership, Embrapa's technologies are licensed to be validated and commercialized abroad. In this kind of contract the licensee pays royalties or a similar fee.

Since 1998, Embrapa has created several virtual laboratories abroad: in France, the Netherlands, the United Kingdom and the United States. Further, with the aim of providing humanitarian aid to low-income developing countries through technology transfer, Embrapa carries out several cooperation projects in all South American and 13 African countries.

Source: UNCTAD, based on inputs from Antonio Flavio Dias Avila, Embrapa (Brazil).

to improved seedlings and processing technologies (World Bank, 2007). In a diversified agricultural innovation system, both agricultural extension services and private businesses – domestic or foreign – become innovation brokers to help farmers identify market opportunities in production and related downstream activities, and link them to sources of knowledge and inputs to grasp those opportunities (Hall, 2009). By linking local farmers and other entities to the global knowledge network of TNCs, in cases where the former can be effectively involved, foreign affiliates become actors in a new approach to technology delivery. This can be an important supplement to the traditional, specialized technology delivery through agricultural extension services. It is best illustrated by the role of Syngenta in the development of Shouguang as a major vegetable production and export base in China (box IV.8).

Domestic entities that already have a threshold level of technological capabilities are more likely to benefit from technology transfer and knowledge spillovers, when they occur: for farmers, through contract farming, and for public research institutes, through cooperative research. Institutions and policies can influence the extent of technology transfer and the efficiency of the agricultural innovation system, with or without the involvement of TNCs in local production and innovation. At the international level, renewed

Box IV.8. Bringing high-value seeds and new technology to farmers: the role of Syngenta in the Shouguang Model

Shouguang in Shandong Province is a major vegetable production, trading and export base in China. It has been identified as one of 18 models of successful local economic development that have emerged in China during the past three decades.

International seed companies have played a role in the development of the Shouguang Model. After an initial investment by Syngenta Seeds in Shouguang in 1998, most of the world's largest seed companies have established their presence there, targeting both the local and national markets. Shouguang Syngenta Seeds Company, a joint venture between Syngenta Seeds and the local government, engages in testing, demonstrating and transmitting the latest results of Syngenta's vegetable breeding research from its global R&D network to Chinese growers. Some of the main vegetable products have included tomatoes, peppers and watermelons. To meet the different climatic conditions, planting habits, product demands and marketing characteristics of different regions in China, the joint venture started R&D on vegetable seeds in Shouguang in 2001.

Syngenta has signed a memorandum with the National Agricultural Technical Extension and Service Centre of the Ministry of Agriculture of China to provide farmers with training in farming and culturing techniques. It has launched an initiative in Shandong Province aimed at reducing the layers of distribution channels and providing direct extension services to farmers. Vegetable growers have received, in addition to high-value-added commercial seeds, instructions on planting and farming, which help them improve the quality and quantity of production and access to international markets, resulting in increased income.

Source: UNCTAD, based on a field study conducted in April 2009.

collective actions in agricultural R&D and increased investment in the associated institutions are crucial (Alston and Pardey, 2006). Policymakers also need to determine how best to involve TNCs in advancing and disseminating useful technologies (chapter V). To fight the food crisis, a daunting challenge is how to create incentives for PPPs that will allow the public sector to use and adapt technologies developed by TNCs to overcome problems faced by poor farmers, especially those growing non-commercial crops.

3. Employment and skills

Agriculture provided jobs for 1.3 billion smallholders and landless workers worldwide in 2007, but in rural areas severe underemployment is still a problem (World Bank, 2007). Generating more and better jobs is therefore an integral aim of sustainable agricultural development, and is crucial for rural development and poverty alleviation (ILO, 1988 and 2008).

The variety of land ownership patterns and modes of cultivation in agriculture give rise to many types of labour relations and forms of labour participation.[19] The involvement of TNCs in the agribusiness value chain affects the size and quality of many of these employment types and forms (section B.3.a). It also influences the level of human resources and skills in the agricultural industries of host developing countries (section B.3.b). As noted earlier, the participation of TNCs enhances the shift to modern commercial farming, which places an emphasis on capital formation and technological progress aimed at ever higher levels of output and productivity. As TNCs are most likely to engage in capital-intensive operations and to employ sophisticated labour-saving mechanical equipment (section B.2), coupled with their low level of participation in agricultural production in many developing countries, these firms make only a limited quantitative contribution to employment in agriculture as a whole. Indeed, to the extent that smallholders may be driven out of business during the process of commercialization and modernization in agriculture, employment in the industry may even decline. At the same time, evidence from case studies shows that in some circumstances TNC participation can create significant employment at the local level, and that the qualitative impact of their participation in terms of enhancing skills and human resources can be significant.

a. Employment creation

The quantitative impacts of TNC participation on agricultural employment can be both direct and indirect. Direct impacts refer to employment creation (or reduction) by foreign-invested plantations, or by foreign affiliates through contract farming. Indirect impacts on employment by local entities resulting from TNC participation can occur through, for example, competition from foreign players, business linkages, and demonstration and spillover effects.

The *direct* impact of an agricultural production project with TNC involvement on the size of employment varies by product, the mode of TNC involvement and the context of the host-country economy and industry. TNC participation through FDI in new production facilities can directly create job opportunities in host developing countries. In some labour-intensive industries like floriculture and tea production, employment generation by foreign affiliates has been significant in countries such as Colombia, Ecuador, Ethiopia, Kenya and Mexico. For example, in Kenya, the cut flower industry, in which TNCs are major players, provides direct employment to about 55,000 people.[20] In the tea industry, Unilever operates in 18 African countries, providing employment to about 20,000 people (OECD, 2008c). Job creation is also increasingly related to South-South investment in agriculture. For instance, Sime Darby (Malaysia), one of the largest plantation companies in the world (chapter III), is undertaking a project for the rehabilitation and expansion of the Guthrie Rubber Plantations in Liberia, which will provide 20,000 jobs.[21]

However, while agricultural employment might rise due to FDI, often because of increased exports induced by improved access to international markets,[22] this may not be sustainable. For example, the shift of TNC activities in banana cultivation from higher cost countries to lower cost ones may threaten employment in the former if they cannot enhance labour productivity and retain their competitiveness (Arias et al., 2003). Moreover, the direct participation of TNCs from developed countries in the production of certain agricultural products may substitute for investment and operations by domestic farmers in a host developing country (section B.1). This displacement tends to reduce the size of overall employment, as TNCs usually utilize more capital-intensive production methods. There is also likely to be a negative impact on employment when large foreign-invested plantations crowd out small local farmers.

Employment opportunities may also be generated by TNCs through contract farming arrangements with local farmers. Studies have found large variations in this respect. On the one hand, in labour-intensive cash crops, there is a significant increase in daily farm employment in crops newly contracted by TNCs. For example, in Kachorwa District in eastern Uganda, a contract farming scheme for growing organic coffee set up by a foreign affiliate encompasses about 4,000 organic farmers, and more than 60% of all households in the area (Bolwig,

Gibbon and Jones, 2009). In the same industry and country, another foreign affiliate[23] also involves more than 4,000 farmers in its contract farming scheme (Nsonzi, 2009). On a larger scale, an international joint venture project in Leshan, China, involved 400,000 farmers in planting fast-growing trees for its production of medium density fibreboard.[24] On the other hand, in cases where a highly mechanized and centralized system is transferred to large local farmers, the situation is quite different and may result in a fall in employment (Glover, 1984; Glover and Kusterer, 1990).

The participation of agricultural TNCs also influences employment *indirectly,* both on- and off-farm. Their involvement along the agribusiness value chain may help create jobs by forming backward and forward linkages with local entities. It can foster off-farm enterprise development and create non-farm employment opportunities.[25] A study on farm and non-farm linkages at the household level in Senegal showed that greater off-farm employment opportunities for rural households – resulting from increased horticulture exports and associated agro-industrialization – had benefited the smallholder farms (Maertens, 2008). In addition, earnings from employment in the growing horticulture export industry in Senegal are partly invested in family farms, resulting in larger farm sizes, higher farm expenditures and higher farm incomes.

b. Skills enhancement

The qualitative aspects of agricultural employment have become an increasingly important concern for developing countries, as reflected in the advocacy by the International Labour Organization of a comprehensive strategy for promoting employment and decent work in rural areas (ILO, 2008).[26] Like FDI in other industries, the primary impact of TNC involvement in agriculture on employment is as likely to be on its skill mix and quality (in terms of remuneration and working conditions) as on the number of jobs created (Dunning, 1993; *WIR94*).[27] In agricultural production, TNC involvement, particularly in large-scale plantations, often creates skill-intensive, better-paid employment. In Chile, the percentage of waged workers in areas focusing on TNC-driven, export-oriented horticulture has risen steadily since the early 1990s, in contrast to stagnation in other production areas with less TNC involvement (wheat, dairy and beef) (Valdés and Foster, 2006). In Kenya, floriculture companies, most of which are foreign-invested producers, have developed a code of conduct, backed by regular audits, with requirements for workers' health and safety, general worker welfare and various labour-related issues.[28]

With regard to its impact on the skills base of host developing countries, TNC participation can help improve domestic manpower through different channels. For example:

- Foreign affiliates need to provide some form of on-the-job training to ensure that the farming methods they use are deployed efficiently. However, decisions on whether to invest in more advanced forms of training depend on the extent to which these firms are exposed to competition and the expected economic returns. These in turn are influenced by the skills provided by the education system and the prospects of retaining trained workers (*WIR99*). The contributions of TNCs to skills upgrading and human resource development are related to the relative newness of specific skills and appropriate technologies in the context of agriculture in a host country.
- Local farmers can learn various skills through contract farming arrangements with TNCs, including record-keeping, efficient use of farm resources, improved methods of applying chemicals and fertilizers, knowledge of quality standards and information on export markets (Eaton and Shepherd, 2001). They can be related to relatively advanced or niche areas, such as organic planting requirements (box IV.9). Farmers can apply some of their acquired skills to the production of other cash and subsistence crops. However, this is not always possible, as some of the skills and techniques learned in contract farming schemes are highly crop-specific and are not transferable to other products (Glover, 1984; Glover and Kusterer, 1990).

However, TNC involvement can also have negative consequences stemming from the possibilities for exploiting their power over labour, which can result in less favourable working conditions. Indeed, the economic, social and political power imbalance between employers and workers tends to be more prevalent in rural areas than in urban areas; rural labour markets tend not to function well partly because labour organizations are usually weaker there (ILO, 2008). TNCs' power over their suppliers in the trading relationship (section B.6) and their constant search for cheap inputs may also create problems for workers and producers. In the global banana industry, for example, the downward spiral in purchase prices has been passed on to workers in the plantations and to small producers, further depressing wages and working conditions in producing countries worldwide,[29] according to the Second International Banana Conference (Arias et al., 2003).

Child labour is a major concern in agriculture throughout the developing world (ILO, 2007). According to the Food and Agriculture Organization of the United Nations (FAO), agriculture accounts for 70% of child labour worldwide, a significant proportion of which is in plantations, such as coffee,

cocoa and banana plantations. In cocoa plantations, for example, hundreds of thousands of children are engaged in hazardous tasks on cocoa farms in a number of African countries, including Cameroon, Côte d'Ivoire, Ghana and Nigeria (International Institute of Tropical Agriculture, 2002). There is regular trafficking of child workers from neighbouring, more impoverished countries, such as Burkina Faso, Mali and Togo, who are sold into forced labour. TNCs in the global cocoa/chocolate supply chain have committed themselves to addressing this problem through their participation in the Cocoa Industry Protocol, the International Cocoa Initiative and the Cocoa Certification and Verification System (see box V.10 in chapter V).

4. Standards and supply chain management

As mentioned earlier, agribusiness TNCs may accelerate and intensify the commercialization of agriculture in host developing countries (see box IV.1). One of the ways they can do this is through the diffusion of international standards with respect to quality and safety of agricultural products (in addition to general standards such as ISO 9000). A major channel for such diffusion is through contract farming. Agribusiness TNCs in the downstream part of the value chain can be grouped into three categories: retailers, traders and food processors (chapter III). This section draws largely on studies relating to transnational retailers or supermarket chains to illustrate the diffusion of standards because they have been more intensively researched than other categories of agribusiness firms. But this does not mean that the impacts of traders and food processors are any less important.[30]

Transnational retail chains have an impact on developing-country farmers not only through their procurement for developed-country markets, but also, increasingly, because of their dominance of the food retailing industry in developing countries. Although agricultural exports from developing countries receive much attention in the literature, the domestic market is generally much more important in terms of size since the share of exports in total food production is very small in most countries. Globally, over 90% of agricultural output is consumed within the country where the production takes place, and the share is even larger in developing regions, except for Latin America. Subsistence farming remains important in some countries, but as a result of rapid industrialization and urbanization, an increasing proportion of the population obtains food through market transactions in which food retailers are assuming a greater role as intermediaries between farmers and consumers. In food retailing, the share of supermarkets is rising fast, although the picture varies widely across regions.[31] Importantly, in the fast growing supermarket segment of the market, it is transnational retail chains that have been expanding fastest through FDI to become prominent, if not dominant, players in the most dynamic segment of food retailing in many developing countries. As such, they are in a position to exert a significant influence on agriculture through both global and domestic value chains; the power they exercise can have both negative and positive outcomes.

a. Diffusion of standards

For major agribusiness TNCs, ensuring the quality and safety of the foods they produce is an important part of their business strategies, especially since the reputation of their brand is an integral element of their competitiveness. They therefore require their suppliers to comply with stringent quality and safety standards, which are often more demanding than Codex Alimentarius, the internationally recognized food safety standard developed by FAO and the World Health Organization (WHO).

As consumers become relatively affluent, they are willing to pay a premium price for food products that have quality and safety certification. This is

Box IV.9. Teaching local farmers to grow organic coffee in Uganda

In the Kawacom Sipi Organic Arabica scheme in Uganda run by Kawacom, an affiliate of Ecom Agroindustrial Corporation (Switzerland), most farmers involved have EU or United States organic certification. Project farmers are required to adopt certain production and on-farm processing practices/methods that prohibit the use of synthetic inputs and encourage the use of other organic practices.

Kawacom employs various means to help growers comply with its organic and quality standards, including group training, individual advice and input provision. A group certification system is used based on an elaborate internal control system, the central component of which is an annual or semi-annual farm inspection performed by locally recruited company field officers. These officers have been trained in organic farming methods, and they run demonstration farms and conduct occasional training. They also give technical advice to farmers during the farm inspections and monitor their performance in terms of their compliance to the organic standards and other project requirements.

Source: UNCTAD, based on Bolwig, Gibbon and Jones (2009).

certainly the case in developed-country markets, but urban consumers in developing countries are also showing the same tendency. In a competitive market, such consumer preferences influence the procurement practices of retail chains. What marks out transnational supermarkets in this regard are their scale and expertise in managing supply chains, which allows them to impose the requirements of markets – notably their consumers – on suppliers more effectively. The main tools transnational supermarkets deploy in managing their supply chains are product standards. Since public standards for food quality and safety are relatively low, or not enforced in practice, in many developing countries there has been a proliferation of private standards by agribusiness TNCs and, subsequently, systems of third-party certification (box IV.10).[32] Indeed, in most cases, the standards that agribusiness TNCs apply in developing countries today are no less stringent than those in use in developed-country markets as a result of the centralization of distribution systems and exports of farm produce.

Standards allow firms to specify, harmonize and manage the product quality and delivery conditions that they require from suppliers. Standards are also used to set criteria for rewarding suppliers who invest in quality and safety management systems. Traditionally, agribusiness firms used standards for coordinating supply chains, which might be spread over many regions or even countries. More recently, however, these firms also use standards as a marketing tool for differentiating goods in response to consumer demand for quality. As a result, in some cases, standards extend to labour and environmental aspects of farming as well (sections B.3.b and C).

Centralization is a key element of agribusiness TNCs' procurement systems. In an effort to reduce the cost of coordinating the supply chain, transnational supermarket chains tend to centralize procurement by establishing distribution centres, instead of letting each store manage its own procurement. The geographical scope of such centralization is not confined within a country; the area served by a central distribution centre may progressively be extended from a country, to a region and even to the global market. Such centralization, in effect, helps to implement the strict standards among all the countries a centralized distribution centre serves (Henson and Reardon, 2005; Berdegué et al., 2005).

Furthermore, it has been observed that the selection of sources by agribusiness TNCs results in a *de facto* extension and implementation of developed-country standards to developing countries. For example, Freshmark, a specialized procurement agent owned by the transnational supermarket chain Shoprite (South Africa), selects its suppliers from areas where the majority of growers also supply export markets and hence are required to comply with the GLOBALGAP (see box IV.10). Thus, much of the

Box IV.10. Coalitions of agribusiness TNCs for setting common standards

A recent development in private voluntary standards for agribusiness industries is the emergence of coalitions by leading agribusiness firms for setting standards (Fulponi, 2006). Some international food standards, such as the British Retail Consortium (BRC) Global Standards, the International Featured Standard, and Safe Quality Food (SQF) 2000, are designed for the processing stage of agribusiness value chains. Others are concerned with the pre-farm-gate stage, covering the entire farming process – from the use of inputs to the produce leaving the farm. The two most widely used pre-farm-gate standards are SQF 1000 and GLOBALGAP.

- *SQF 1000.* The SQF Program is a global food safety and quality certification programme and management system. Launched in 1994 in Australia, since 2004 it has been administered by the SQF Institute (SQFI), a division of the Food Marketing Institute (FMI) based in the United States. It has 1,500 member companies in the food retail and wholesale industries around the world. The programme comprises two codes: SQF 1000 for primary production and SQF 2000 for food manufacturing and distribution.
- *GLOBALGAP* (formerly EUREPGAP) is a private sector body that sets voluntary standards for the certification of agricultural products. Its membership includes retail and food service providers, producers/suppliers and associate members from the input and service side of agriculture. Some European chains apply GLOBALGAP to supplies of some fresh produce and meat products from developing-country markets (Henson and Reardon, 2005).

Efforts to harmonize standards are still ongoing, led by the Global Food Safety Initiative (GFSI), which was launched in 2000. The GFSI is coordinated by CIES – The Food Business Forum, a global food business network comprising 400 retailers and manufacturers across 150 countries.

In addition, there are a number of commodity-specific pre-farm-gate standards, including: the Common Code for the Coffee Community (4C), initiatives from the Sustainable Agriculture Initiative Platform (covering wheat, palm oil and dairy products), Cotton Made in Africa, and the Better Cotton standard. The nature of these standards is slightly different from food safety standards in the sense that they are explicitly aimed at helping small-scale farmers or promoting sustainable farming.

Source: UNCTAD.

produce sold by Shoprite's retail network throughout the African continent is effectively governed by the same safety and quality standard as in Europe (Weatherspoon and Reardon, 2003).

b. Use of contract farming and specialized procurement agents

For agribusiness TNCs, it can be difficult to enforce standards in traditional wholesale markets as it is hard to trace the origin of the produce sold in these markets and, under such circumstances, supermarkets can exert little leverage on producers with regard to farming methods. Furthermore, it is difficult to ensure a constant volume of supply that meets a particular standard through such markets. To resolve these problems, companies often resort to contract farming for sourcing agricultural produce; or, alternatively, they outsource the procurement function to specialized agents, which in turn establish contractual relationships with farmers.

A consequence of agribusiness TNCs' implementation of private standards has been the decline of traditional wholesale markets in developing countries where they operate. Since the TNCs have few possibilities to control and verify farms' production processes when they buy through wholesale markets, they often interact directly with host-country farmers through contract farming. Alternatively, they outsource the procurement and distribution functions to specialized procurement agents dedicated to the supermarket industry.[33]

In order to ensure that production processes and farm produce conform to their requirements and that produce is delivered on time in sufficient quantities, agribusiness TNCs or their specialized procurement agents form a contractual relationship with their suppliers, sometimes referred to as a system of preferred suppliers.[34] Under this arrangement, the agribusiness firm "lists" suppliers and commits to purchasing certain produce from them. The benefits that "listing" brings to farmers (suppliers) can be considerable. It provides a guaranteed market, and, if stipulated in the contract, at a predetermined price. Contracts with transnational supermarket chains, which dominate the most dynamic segments of the food retail industry, are likely to offer potential for further growth. In addition, the range of produce required by supermarkets tends to involve more intensive use of labour, thus enabling family-run farms a fuller use of household labour.

Although there can be enormous potential benefits to contracted farmers, they also face considerable hurdles in meeting their obligations as suppliers. Controlling the quality and attributes of farm produce, for instance, requires management of production through the use of fertilizers, pesticides and other systems that protect the crops from variability in natural conditions (e.g. irrigation systems and greenhouse). Thus suppliers to agribusiness TNCs need to have the capability to manage a modern business operation effectively. In addition, assuring quality and safety of foods is based on the principle of traceability, which requires farmers to maintain detailed bookkeeping records. Farmers may also need to adopt the technologies required for packaging and bar-coding. Finally, unlike selling directly through more traditional markets, delivering to supermarkets may not result in immediate payments, since some chains operate a long-term payment system. Thus the ability to manage financial flows, including obtaining credit, becomes an essential part of running a farm. It is evident that managing such a capital- and knowledge-intensive operation requires a high degree of technical and managerial expertise on the part of the farmers.

Even those farms that succeed in establishing themselves as suppliers to agribusiness firms face a number of challenges. For instance, as mentioned above, farms need to make considerable investments to modernize operations and adapt farming patterns and practices to meet the requirements of agribusiness TNCs. Moreover, although farms might enter into a contractual relationship with the companies voluntarily, over time it becomes difficult for them to exit the relationship, given the considerable fixed investments they will have made. Thus these farms may become dependent on agribusiness firms, which weakens their bargaining power (Watts, 1994). The problem is especially acute in countries where agribusiness industries are concentrated in a few large firms (section B.6).

There are also possible broader negative consequences. For instance, the procurement practices of agribusiness TNCs, based on enforcing standards and establishing a system of preferred suppliers, are likely to induce structural changes in agriculture in favour of larger, more capital- and knowledge-intensive farming operations, to the detriment of small-scale farmers. Further, farmers who succeed as suppliers are often those who are willing to concentrate on the production of a smaller variety of crops to facilitate screening and monitoring, hence improving farmers' links to markets and income prospects, but at the cost of crop variety. In addition, standards may specify a number of conditions for seeds, which could limit farmers' choice of seed suppliers. Given the increasing dominance of a few TNCs in the seeds market, there are concerns that such a requirement further weakens the bargaining position of farmers vis-à-vis seed suppliers (section B.6).

c. Agribusiness TNCs' supply chains and the decline of small farmers

Not all farmers are in a position to benefit from the increased presence of transnational supermarket chains or food processors in their countries' markets (box IV.11). Small-scale farmers in remote areas are particularly ill-equipped to cope with the changing nature of the value chain. For produce that commands premium prices, such as fruits and vegetables, supermarkets expect crops to be harvested and delivered fresh, perhaps on a daily basis, which implies that the farms need to be situated in areas where transport and logistics systems are reasonably well developed. Similarly, for commodities characterized by a low value per unit of volume, such as wheat and soya, adequate infrastructure that facilitates transportation of large quantities of goods is essential.

For farmers who fail to meet the requirements of agribusiness firms, market conditions could become increasingly difficult. Experience in Latin America, where supermarket retailing is more developed than in other developing regions, suggests that supermarkets and specialized procurement agents are increasingly dominating the food marketing industry in urban areas, marginalizing small traders, spot food markets and neighbourhood stores. As a result, alternative outlets for those small farmers who fail to meet the requirements of supermarket chains could diminish (Dolan, Humphrey and Harris-Pascal, 1999; Reardon and Berdegué, 2002).[35]

Evidence from dairy industries in Argentina and Brazil shows that smaller producers who did not meet the threshold scale of operation required for supplying retailers, mainly TNCs, have exited the industry or operate in the informal sector. In that sector they serve local markets where there are no formal standards and control systems and taxes are not paid, thus allowing them to charge a lower price (Farina et al., 2005). Others have found employment as labourers in larger operations. Partly in response to such trends, and in order to sustain the viability of small-scale farming, donors, non-governmental organizations (NGOs) and public sector institutions have been taking a closer look at the role of producer organizations. One course of action has been to assist the formation of cooperatives and other forms of producer organizations (chapter V).

5. Foreign-market access and exports

Various trade barriers and subsidies in developed countries limit the scale and scope of agricultural exports from developing countries (chapters III and V). In addition, the proliferation and increased stringency of quality and safety standards (section B.4) has become a source of concern among some developing countries, as these standards are perceived by them as a barrier to their agricultural exports (Unnevehr, 2000; Garcia-Martinez and Poole, 2004). Against this background, what role can TNCs play in helping developing countries access foreign markets and enhance agricultural exports?

In agriculture today, TNCs have only limited involvement in the production of agricultural commodities exported from developing countries, focusing instead on downstream operations (chapter III). While several developing countries have acquired and/or developed the capabilities and technologies needed for successfully exporting their agricultural products – traditional or newer, high-value ones – many others have not. In such circumstances the role

Box IV.11. Do agribusiness TNCs procure from small-scale farmers?

In general, agribusiness TNCs avoid dealing with small farmers, as this is often very costly. But the profitability of a supply network depends on the market conditions. The price at which the agribusiness firm can sell its output in relation to the cost of procurement is the overriding factor. In addition, the availability of large-scale farmers and competition from rival firms for the sourcing of farm produce are important considerations.

The experience of dairy farmers in Latin America has received much attention in the literature, as indicative of the plight of small-scale farmers in modern supply chains. In Brazil for example, it is alleged that the procurement practices of Nestlé, along with other large dairy processors, were responsible for driving as many as 60,000 small-scale dairy farmers out of business in the period 1997–2000. Nestlé alone is reported to have shed 20,000 farmers from its supplier list during this period (Farina, 2002). Other studies on small-scale farmers suggest that the scale of operation is not necessarily the determining factor, but it still seems essential for small-scale farms to be well capitalized in order to succeed (Reardon et al., 2005).

It is not surprising, therefore, that the development community has aroused concern. Globally, however, evidence on this issue has been mixed, suggesting that TNCs' procurement strategies vary widely depending on the market conditions. In economies where large-scale farmers are rare, agribusiness TNCs have no choice but to procure from a large number of small-scale farmers. For instance, in contrast to the experience in Latin America, Nestlé in Pakistan sources half a million tonnes of milk a year from more than 135,000 small-scale dairy farmers through milk delivery points in 2,000 villages.

Source: UNCTAD.

of TNCs – international trading companies, processing companies and supermarkets – in helping to increase the competitiveness of agricultural exports of many developing countries should not be underestimated.

Many developing countries possess comparative advantages (based on factor endowments and costs) in agricultural production. However, these advantages are a necessary but not sufficient condition to initiate, sustain and increase exports.[36] Many other conditions are needed, such as producers' responsiveness to export opportunities, knowledge of changing consumer preferences, and established brands in the case of differentiated products. The potential contribution of TNCs to agricultural exports consists of providing the missing ingredients so as to allow countries to exploit their comparative advantages. TNC involvement can help them exploit static comparative advantages (in traditional standardized commodities and products), and also in a number of cases the development of dynamic advantages (in higher value added products). At the same time the risk of becoming over-dependent on these companies for exports is a crucial consideration.

TNCs can have large internal (intra-firm) markets, accessible only to their affiliates or associated firms. They also control or have access to large markets of unrelated parties, and can therefore influence the granting of trade privileges in their home (or third country) markets. TNCs dominate international markets for some agricultural products and a large part of international trade in those products is intra-firm trade, which makes access by independent producers difficult, if at all possible. Furthermore, some TNCs have established brand names and distribution channels with supply facilities spread over several national and international locations. This makes it difficult for developing-country firms to gain physical access to international marketing and distribution channels to consumers. The strong TNC domination of market access to developed-country markets is particularly evident in classical cash crops such as coffee, where international trade and the value chain in general are dominated by a handful of international trading houses and roasters (box IV.12 illustrates an interesting exception to this general tendency).

Box IV.12. Bypassing established coffee value chains: not easy but possible

For the bulk of globally traded coffee, international trading houses and processing TNCs ("roasters", such as Eduscho, Lavazza, Jacobs Suchard, Tschibo and Nestlé) buy green coffee beans in coffee-growing countries and the role of developing-country participants in the value chain usually ends there. One of the main reasons is that coffee sold to final consumers is generally a branded product. Developing a coffee brand (or any brand) and successfully nurturing and marketing it in intensely competitive markets is very costly and risky. It also requires a continuous, large supply of consistently high-grade coffee. Attempts by developing-country enterprises to develop own brands, and thus circumvent the value chain by eliminating intermediaries, more often than not have failed. But there have been some successes, often in some form of association with TNCs.

One way of shortening the coffee value chain is to use fewer intermediaries (notably international trading companies) and develop own brands. This is not easy, but there are very few global coffee brands that are owned by coffee producers. A recent example of a "shortened value chain", whereby developing-country producers sell coffee directly to developed-country markets, is the company, Juan Valdez Café from Colombia. Run by the National Federation of Coffee Growers of Colombia, a non-profit organization, the company has successfully capitalized on the good reputation of Colombian coffee, particularly in the United States.[a]

Another way to sidestep existing value chains is to develop niche products such as organic coffee, if necessary in partnership with TNCs and/or with the support of development agencies. An example is the cooperative of the Indigenous Peoples of the Sierra Madre of Motozintla (ISMAM), which represents over 1,500 indigenous smallholder families who grow organic coffee at high altitudes in Southern Mexico. ISMAM formed a partnership with German coffee roaster Niehoff and a French importer Schorn SA in late 2002, each partner holding a stake of one third in the venture.[b]

An often neglected aspect is that some TNCs specialize in providing a wider range of services to (potential) exporters based on management contracts. For example, ED&F Man, a Swiss-based TNC with affiliates operating in 16 of the top 20 coffee-producing host countries, provides farm management services in Kenya through its affiliate, Coffee Management Services. The services include financing, farm inputs, accountancy services, feasibility studies (e.g. environmental and social assessment studies), marketing, certification compliance and farmer training.[c] In addition, it uses the latest research and technology to assist farmers in accessing international coffee markets.

Source: UNCTAD, based on Krüger and Negash (2009).

[a] See: www.juanvaldezcafe.com, www.juanvaldezcafe.us/Locations.asp, and Roldán-Pérez et al. (2009).

[b] See: www.farmingsolutions.org.

[c] See: www.coffeemanagent.co.ke.

a. Trading TNCs and exports of traditional agricultural commodities

Historically, in agricultural commodities such as coffee, cocoa, tea, sugar and bananas, TNCs from developed countries were involved in exporting from developing countries. In many cases they owned plantations and farms for producing and exporting these products. In other cases, specialist traders bought produce from agricultural TNCs and sold it in international markets. Even today, their significant role as intermediaries in trade in traditional agricultural commodities (UNCTC, 1983) has not changed much. Although TNCs have become less important players in agricultural production in developing countries in recent decades, they remain entrenched in trade (chapter III).

For example, coffee trading TNCs purchase the commodity from host countries' farmers through spot market transactions, but also through contractual arrangements, such as contract framing which entails a degree of participation in agricultural production. Contracts seek to guarantee the supply of and demand for coffee – usually raw or semi-processed. They typically stipulate the quantity, price and quality of coffee and distribute risks between the contracting parties. These contracts help farmers receive from TNCs goods and services which are necessary for efficient export production. In turn, the TNCs receive coffee, usually raw or semi-processed, and process it further. The TNCs are responsible for marketing and managing the whole operation.

Some trading TNCs from developing countries have acquired knowledge, capabilities and experience, permitting them to successfully compete in international markets with traditional TNCs from the North. In addition to trade intermediation, which remains an important function, they have evolved into global supply chain managers. In many host countries, developing-country trading TNCs have become major players in export-oriented and domestic agriculture. They help generate, sustain or increase exports by providing the necessary ingredients, and occasionally help those countries exploit their comparative advantages or upgrade their existing advantages (box IV.13).

b. TNCs and exports of non-traditional agricultural products

The most dynamic part of agricultural trade has been the trade in higher value, non-traditional products, such as vegetables and cut flowers. Developing countries are taking a rising share in global exports of these products. It has enabled a number of these countries to diversify away from stagnating traditional commodity exports towards higher value agricultural exports, for which the demand is rapidly growing.

Non-traditional products are easier to export as they have not been as adversely affected by trade barriers. But at the same time, their export markets are very demanding in terms of quality, volume, delivery conditions and timing, which puts pressure on developing-country producers and exporters. Most of these products are exported for sale to developed-country consumers, and market access is almost entirely controlled by companies from developed countries. Indeed, international markets for non-traditional agricultural products are essentially driven by TNCs – supermarket chains and processing companies – which control and coordinate

Box IV.13. The role of TNCs in upgrading Africa's exports of cashews

African countries account for one third of the world's raw cashew nut crop, but less than 3% is processed (and consumed) in Africa. Their inability to process cashews is due to many factors related to the farming process, lack of capabilities and government policies. Labour costs in Africa are high, compared to those in India and Viet Nam, and labour regulations do not address specific industry requirements. Selling processed cashews would require the ability to access markets and, in the case of Africa, overcome the unfavourable reputation of African kernels. Government intervention, such as setting minimum prices for farmers, charging export duties and not permitting traders to buy directly from farmers, has often been misplaced and undercuts export competitiveness. In extreme cases it has had an adverse impact on existing exports and on the very farmers it was supposed to help.

Olam, a Singapore-based TNC, is a leading trader of cashews in the world. For two decades, it has exported raw cashew nuts from Africa for processing by independent agents or by its own processing affiliates in Brazil, India and Viet Nam. In 2003, Olam started a programme of local processing in a number of African countries to upgrade their exports. It built processing factories in Côte d'Ivoire, Mozambique, Nigeria and the United Republic of Tanzania. In 2008, together with a few partners, Olam started a five-year plan aimed at increasing productivity and processing capabilities in Africa. A project in Côte d'Ivoire focuses on improved farming and post-harvest practices. In the United Republic of Tanzania, with the help of the Government and funding from USAID, Olam participates in a programme aimed at increasing yields, and the productivity and incomes of small farmers. As a result, exports of processed kernels from Africa have taken off.

Source: UNCTAD.

international agribusiness supply chains. These TNCs have therefore been instrumental in increasing and diversifying developing-country agricultural exports towards higher-end products. They have provided the necessary ingredients for boosting agricultural competitiveness, thus helping several developing countries to shift from static to dynamic comparative advantages in agricultural exports, as illustrated by the development of horticultural exports in Kenya.

Initially Kenya had few skills, technology, processes and, most importantly, knowledge of, and access to, foreign markets, where demand for fresh vegetables and cut flowers has been growing rapidly.[37] TNC participation in Kenya's horticulture industry has helped boost exports and secure market access. In Kenya's exports of vegetables to the United Kingdom, for example, supermarkets play an important role: they accounted for three quarters of Kenya's fruit and vegetable sales in the United Kingdom in the second half of the 1990s (Dolan and Humphrey, 2004). The necessity of creating and enforcing standards and related activities, driven by consumer needs in the United Kingdom, has led supermarkets and importers to establish instruments of coordination and control, which resulted in the upgrading and transformation of the horticulture industry in Kenya.

However, while TNCs can support developing countries' efforts to exploit their dynamic comparative advantages in agricultural production, such support varies by country and commodity. Furthermore, an over-reliance on corporate supply chains can breed dependence on TNCs. For example, a negative side of the entry of the Kenyan vegetables into international markets is that smallholder production is less viable in a vertically integrated international industry structure serviced by large-scale production units. The few Kenyan players large enough to provide vegetables at the prices, standards and time schedules required by international supermarkets are largely locked into these retailers' supply chains (at least in the short run). At the same time, small firms become detached from such chains (Dolan and Humphrey, 2004). Reliance on TNCs for access to foreign markets is therefore a double-edged sword.

6. Competition and market power

Issues of competition and market power concern all stages of the value chain. Salient issues can differ depending on the specific agricultural markets, ranging from traditional smallholder production of basic foodstuffs to production of non-traditional agricultural export commodities like cut flowers. In any case, TNC entry into agricultural production can have important consequences for competition and market power in the relevant product and factor markets.[38] Its impact in these respects should be seen in the context of the general tendency of TNCs to participate in markets that have a relatively high degree of concentration. This has been attributed to the technology intensity of the markets, which can result in high capital intensity, and the demand for differentiated products (potentially the result of branding). Both can prevent new market entries and lead to market imperfections that allow TNCs to capitalize even more on their technological advantages (*WIR97*).

The relationship between concentration, competition and efficiency of agricultural commodity markets can be a complex one. Market concentration (i.e. large market shares held by a few participants) should not be considered necessarily equivalent to low competition and "the ability of a firm, or a group of firms acting jointly, to raise (or decrease) and profitably maintain prices above (or below) the level that would prevail under competition for a significant period of time" (UNCTAD, 2008d: vi). Even a situation of a few competitors and high market concentration can be consistent with a high level of efficiency, for example through economies of scale and fierce competition among the few. Nevertheless, markets highly concentrated on the buyer or seller side offer opportunities for market power, and abuses thereof.

In agricultural production, TNC entry can result in higher market concentration, but only in the case of commodities where the tendency of TNCs to use highly mechanized, capital-intensive agricultural production techniques may render smallholders uncompetitive. For many agricultural commodity markets, the sheer size of TNCs and their technologies and strategies can mean an "industrialization" of production. This is no more evident than in the extreme case of livestock: "Three quarters of the world's chicken, two thirds of the milk, half of the eggs and one third of the pigs are produced from industrial breeding lines" (Gura, 2008: 2). In fact, large-scale production is already a part of developing countries' agriculture, and is growing; but for most countries and most products this is not yet the dominant form of production, nor is it likely to be in the near future (Hazel et al., 2006).

Production technologies in some agricultural industries like sugar are particularly unfavourable for producers in terms of market power distribution, with a large number of farmers selling to one (or only a few) processors. In some industries, and in a number of countries, TNCs have established monopsonies, as in the case of sugar.[39] However, this relationship is not at all dependent on the processor being part of a TNC or not; and there are potential differences, as TNCs frequently copy the operation model used in the home country. This often makes them more efficient, but at the same time more responsive to the needs of their suppliers, as they are commonly under

observation from their home country for their good behaviour. The sugar market is a typical example, where producer associations and State intervention have been instrumental in securing greater benefits for producers by reducing the market power of TNCs (chapter V).

Market power as a result of TNC participation can be very strong, but its abuse is hard to prove. In many countries, production and marketing of a number of agricultural commodities were previously regulated through forms of marketing boards until the late 1980s and early 1990s. Thereafter, deregulation and liberalization in many developing countries led to the weakening of "aggregated producer power". The power asymmetry on these markets was further skewed by an increasing concentration at the buying end (trading, processing and retailing) of many agricultural commodity value chains, frequently dominated by TNCs. The coffee and cocoa value chains are good examples, with only a few companies sharing most of the market.

The most concentrated stage of many agriculture-based value chains is international trading. Concentration at that stage is often blamed for the growing price difference between global and domestic markets. The significant role of international trading companies (all TNCs) has not changed much since the late 1970s (UNCTC, 1983); indeed, in a number of products it has even increased, leading to a higher degree of concentration and thus market power of TNCs in these markets. It is at this stage in the value chain that economies of scale and the know-how of TNCs (the traders) seem to be the crucial competitive advantages over newcomers, which guarantees their continuing dominance. High and increasing concentration, and therefore the market power of transnational trading companies, is considered a major reason behind the growing difference between world and domestic prices (that is, developing-country exporters' f.o.b. prices) of such products as wheat, rice and sugar. This difference more than doubled between 1974 and 1994. It is generally believed that when an industry's four largest companies' combined market share exceeds 40%, "competitiveness [of markets] begins to decline, leading to higher spreads between what consumers pay and what producers receive for their produce" (World Bank, 2007: 136).

Examples of high concentrations are found in many agribusiness value chains. In the coffee industry, for example, international trading companies and roasters intermediating between some 25 million farmers and 500 million consumers have a share of 40% (for the largest four players in trading) and 45% respectively.[40] The share of revenues of major coffee producing countries in the retail price at destination declined from one third in the early 1990s to 10% in 2002, while the sales of coffee doubled. Similarly, in the cocoa market, concentration ratios of trading companies, cocoa grinders and confectionary manufacturers range from 40% to 50% (World Bank, 2007).[41]

Similar developments have been reported for other commodities like sugar, grain, tea and flowers. Consequently, developing countries' claims on value added fell from around 60% in the early 1970s to less than 30% in 1998–2000 (World Bank, 2007).[42] However, the declining shares of farmers in retail prices can also be due to changes in processing and marketing. Before jumping to conclusions of abuse of market power, it is therefore necessary to determine if the respective cost structure has changed in the downstream stages of the respective value chains. To date, the few attempts to attribute downward movements in the producers' shares of retail prices to rising TNC market power have not been successful (Gilbert, 2008).

Contract farming arrangements offer opportunities for the abuse of asymmetric power relations. This arises from the way TNCs – particularly trading firms – engage with smallholders, which gives the former more influence in determining the production method and other quality-determining factors. The unequal distribution of market power in such arrangements can produce some very undesirable outcomes. It has been argued that the bargaining power between TNCs and contract farmers is so unevenly distributed that abuses occur regularly (Singh, 2002; Kirsten and Sartorius, 2002).

Beyond individual segments of the agribusiness value chain, a few very influential alliances of TNCs have emerged which span various upstream and downstream stages of respective value chains. The three most advanced alliances of this sort are alleged to be Monsanto/Cargill, ConAgra and Novartis/ADM (Archer Daniels Midland). As agglomerates of vertical activities related to agricultural production, they encompass seeds and chemicals, processing, packaging and trading activities, and for more than one commodity (Bruinsma, 2003). This situation, if empirically and analytically confirmed, is qualitatively different from concentration within a single industry that has been relatively common in the past few decades. The global supply of proprietary seeds and agrochemicals is controlled by only a few TNCs. For instance, the top four seed TNCs control 53% of the global proprietary seed market: the leader – Monsanto – accounts for 23% of this market (ETC Group, 2008).[43] This strong power of big TNCs in some chains, such as that for soya (box IV.14), raises concerns about how much room is left for competition, for consumers' choices and for independent farmers in the respective markets.

In the face of large TNC buyers, producer organizations can bundle "producer power" as a way

to mitigate power asymmetries. More direct linkages between consumers and producers can also help by "short-circuiting" the channels that some TNCs control, as in the case of fair trade. In addition, fair trade organizations have created a mechanism by which consumers can choose to pay a premium in support of farmers – a growing trend, but from a small base. For instance, fair trade coffee accounts for very little of globally traded coffee, estimated at 1–2% in 2002,[44] but growth rates from this low level are high (United Kingdom, DFID and ODI, 2004; IISD, 2008). The fair trade system helps distribute the higher revenue to the producers, and evidence suggests that this mechanism strengthens agricultural cooperatives (Milford, 2004). However, only a limited number of farmers in developing countries are part of related certification schemes.

In the light of existing evidence, the emerging picture of competition, concentration and power distribution in agricultural commodity markets in which TNCs play an important role, especially in processing and trade, seems to be unfavourable for producers in developing countries. The high level of concentration at the downstream end of agribusiness value chains vis-à-vis an often atomized group of sellers (farmers) suggests the prevalence of a highly unequal distribution of market power that should be addressed by host-country governments and development partners to avoid the abuse of that power. Various measures are available to host countries to counter excessive market power (chapter V).

7. Implications for the host economy

The overall effect of TNC participation on agricultural production depends on the interplay between beneficial and adverse effects of their involvement in the various interrelated areas of impact discussed above. It has generally increased the income of domestic farmers, who are either directly employed by foreign-invested plantations, or involved in contract farming schemes operated by foreign affiliates. In any particular case, there can be negative outcomes in some aspects of agricultural production (e.g. job losses) and positive ones in other aspects (e.g. improved productivity). The result is context-specific, varying by type of product, the mode of TNC involvement, and host-country characteristics, especially the policy and institutional environment. Beyond its effects on various aspects of agriculture, the involvement of TNCs in agricultural production has various broader economic implications for host developing countries.

Box IV.14. The soya value chain: domination of a few TNCs

The global trade and processing of soya beans is concentrated in only a small number of TNCs, which are involved – directly or indirectly – at each stage of the soya value chain through financing, partnerships and/or ownerships. They therefore control key elements of production, processing, trading and marketing.

The first part of the soya value chain (i.e. input provision) is dominated by a handful of TNCs. Monsanto's near monopoly position in GM soya bean seeds gives it a dominant position as a seed and agrochemical supplier to soya farmers. Thus, while GM soya beans were used on almost 60% of the total area worldwide under soya bean cultivation in 2005, Monsanto's biotech seeds and traits accounted for almost 90% of the worldwide area planted with GM soya bean seeds.[a]

Corporate farming of soya by TNCs has been very limited, although a number of cases have been reported recently. In countries like Paraguay and Uruguay, foreign individual farmers, entrepreneurs and investors have migrated from neighbouring countries (Argentina and Brazil) and have played a major role in the development of soya farming. Nevertheless, transnational trading companies have a significant influence on the farming stage of the value chain through the provision of credit and inputs to farmers.

In the trading stage of the chain, four TNCs dominate world trade in soya beans (as well as many other commodities): ADM Co. (United States), Bunge Ltd. (United States), Cargill Inc. (United States) and Louis Dreyfus Group (France).

Traders provide resources to farmers, to ensure the supply of soya and other agricultural materials for their agribusiness operations and for stages of the value chain in which they are also important actors, such as crushing, processing and manufacturing. ADM, Bunge, Cargill and Louis Dreyfuss control 43% of crushing capacity in Brazil and almost 80% in the EU (Dros, 2004). In Paraguay, Cargill distributes seeds to farmers, runs the country's largest soya bean processing plant and buys 20% of the soya beans produced.[b] Trading TNCs have also invested heavily in crushing capacity in the major soya-importing countries. Besides the four main soya trading TNCs that control almost 80% of crushing capacity in the EU, in China, for instance, foreign companies (such as ADM, Bunge and Cargill from the United States, and Wilmar from Singapore) control about 40% of crushing capacity.[c]

Source: UNCTAD.

[a] See: "Monsanto's soybean monopoly challenged in Munich: European Patent Office will decide fate of species-wide soybean patent on 3 May 2007", News Release, ETC Group, 30 April 2007 (www.etcgroup.org).

[b] See: "Soybean fever transforms Paraguay", *BBC News*, 6 June 2005.

[c] See: *The Economic Observer Online*, 13 March 2009 (www.eeo.com.cn) and "China seeks to calm anger over soy imports", Reuters, December 11, 2008 (www.reuters.com).

Linkages. TNC activities in agriculture can have linkage effects beyond the industry, which contribute significantly to growth and development. They include interactions with suppliers (backward linkages), with customers (forward linkages) and with others that are not part of agribusiness value chains. Backward and forward linkages between foreign affiliates in agricultural production and domestic firms can lead to the emergence of new economic activities in manufacturing and services, strengthen domestic enterprises, and promote the diversification and growth of the overall host economy. There are successful examples in a number of developing countries.

In Uganda, for example, TNC involvement in coffee, floriculture and fishing has led to *backward linkages*, and therefore to the development of domestic industries that supply goods or provide support services to foreign affiliates (Nsonzi, 2009). In Brazil, domestic enterprises that have benefited from *forward linkages* as a result of TNC involvement in the production of sugarcane include manufacturing firms using milling by-products or outputs, animal feed factories, soda and confectionary firms, and biofuel and energy producers and distributors (Neves, Pinto and Conejero, 2009). In some cases, the initial stages of processing of some commodities are retained in the home country.[45] Such forward linkages can be especially valuable as a first step in agriculture-led industrialization and upgrading of value chains, with larger shares of the overall value added remaining in developing countries.

In Kenya, floriculture has benefited from an additional synergy with the tourism industry through air transport, which is a key service provider to both floriculture and tourism. The existence of a vibrant tourism industry, with air connections to Europe several times a day that had excess capacity on the northbound leg of the journey, helped support the flower industry before it reached the critical mass to be able to charter whole cargo flights (World Bank, 2005).

Infrastructure development. TNCs' investment in infrastructure facilities to support their agricultural projects can benefit farmers in connected locations and promote rural development in general. For instance, roads built as part of an agricultural project could, in addition to supporting TNCs' activities, help other farmers get their crops to the market, and also facilitate local business and social activities. In Mozambique, for example, Companiha de Sena S.A.R.L. (a sugar plantation rehabilitation project undertaken by a Mauritian investor) has contributed to local infrastructure development, including transport infrastructure, water supply, electrification of a village, and upgrading of a school and hospital in that village.[46] Implications for the host country go well beyond economic ones, as infrastructure, such as roads, electricity or water, brings important benefits in terms of improving accessibility and quality of health, education and other social services (UNECA, 2007). Therefore, these are important considerations for governments when signing contracts or negotiating for large-scale investments in agriculture with TNCs, sovereign wealth funds, or other new investors.

Fiscal revenues. Evidence is scarce and inadequate to conclude that direct fiscal effects from FDI or other forms of TNC participation in agriculture might be sizeable. However, one specific benefit of TNC involvement in agriculture might be the formalization of parts of otherwise largely informal economies. This can be true for businesses related to TNCs (i.e. suppliers), especially because the process of standardization leads to the measurement of all aspects of production, costs and revenue, which make it possible for the government to collect taxes. It can also apply to workers employed by TNC affiliates (and probably even to contract farmers) who hold jobs in the formal sector and therefore are obliged to pay income tax. Importantly, the use of enhanced fiscal revenues should not be neglected: they enable governments to establish the foundations for wider development and modernization, be this through social and physical infrastructure, investment in enterprises or other measures.

Balance of payments. Problems with insufficient generation of foreign exchange through trade make the external macroeconomic balance a challenge for many developing countries. How and to what extent FDI and other forms of TNC participation in agriculture contribute to the generation of foreign exchange earnings, or have the opposite effect, is thus important for a number of developing countries' growth prospects. On the one hand, there is the implicit assumption that, more often than not, because of their involvement in global agribusiness value chains, TNC activities in agriculture will have a strong positive balance-of-payments effect, as much of the output tends to be exported (section B.5). This applies to both traditional and non-traditional export crops, such as coffee, tea, cocoa, bananas and cut flowers. In addition, for some crops, such as sugar, there can be significant import substitution effects that are frequently intended and observed.[47] On the other hand, expenditure on imported inputs can substantially water down the level of foreign exchange generated. TNCs in agriculture frequently use production techniques that are highly dependent on more sophisticated inputs. This could even turn the overall balance-of-payments effect negative, particularly if there is an intention to sell the produce locally.

Another issue concerning the balance of payments is that many developing countries –

including least developed countries (LDCs) – are highly dependent on one or a few agricultural commodities for the bulk of their export earnings, and thus face considerable risk in terms of demand and price volatility.[48] On the other hand, when properly managed, agriculture offers some countries options for diversification beyond their heavy dependence on extractive industries (*WIR06*),[49] and, with TNC participation, it offers additional options for diversification beyond the traditional choices of manufacturing and services. Each case needs to be carefully evaluated to find appropriate commodities with strong long-term prospects, whose prices are, ideally, not highly correlated to prices of currently extensively exported goods. For instance, TNCs in dynamic agricultural industries such as horticulture (section B.5) offer opportunities for diversification.[50]

C. Broader implications

The implications of TNC involvement in agricultural production for host developing countries extend beyond agriculture and the wider economy. There are concerns about their environmental, social and political repercussions. This section examines some aspects of these broader implications and, in the case of food security, also considers the implications for developing home countries.

1. Impact on the environment

In agriculture, as in other industries, the impact of TNC activities on the environment is an important aspect of their overall effects on sustainable development in host countries. Agriculture and the natural environment are closely intertwined. Farming has contributed over the centuries to creating and maintaining a variety of semi-natural habitats (European Union, 2003). However, production activities in agriculture, like those in other industries, can also harm the environment through their damaging effects on air, water, soil and biodiversity (chapter III). Mitigating the adverse effects and strengthening the positive interactions with the environment, including climate change,[51] are increasingly considered an important part of countries' efforts to promote sustainable development.

The environmental impact of TNC participation in agricultural production depends on a number of factors, including: the specific crop or activity in which the TNCs are involved, the production technologies they use, their scale of operations, their management strategies and practices, and host-country and international rules and regulations with respect to the environmental impacts of production activities in agriculture. Given that agricultural production inevitably has some negative effects on the environment, the question is whether TNC involvement reduces or accentuates those effects. It is unlikely, especially in the light of the location-specific factors driving TNC activities in agriculture, that TNC involvement in developing countries' agricultural production reflects shifts of pollution-intensive activities from home to host countries.[52] However, the nature and scale of many of the production activities in which they are involved make the question of their environmental impact particularly relevant.

In terms of transferring and disseminating technologies in support of sustainable agriculture development in developing countries, TNCs have played both positive and negative roles. In the cut flower industry, for example, foreign-owned farms introduced environment-friendly farming technologies such as the use of geothermal steam to fight fungal diseases and the introduction of integrated pest management systems (Wee and Arnold, 2009). In the banana industry in the late 1980s and early 1990s, the technologies used by TNCs caused some environmental problems (see discussions below). Since the late 1990s, TNCs have adopted increasingly environmentally sustainable practices in their plantations. In particular, organic planting technologies and standards introduced by them have contributed to more value creation and higher income for farmers (Liu, 2009).

Research and information on the environmental aspects of TNC involvement in agricultural production activities in host developing countries is limited. However, there are a few studies that provide some insights into the environmental impacts and implications of their evolving practices in a few specific areas of agricultural production.

Banana plantations in Latin America. As noted earlier (chapter III), TNCs have dominated the world banana trade since the early twentieth century through their vertically integrated value chains. In the late 1980s and early 1990s, their intensified use of inputs in the plantations in Latin America gave rise to a series of environmental and labour problems. In 1992, for example, the second International Tribunal on Water in Amsterdam condemned the Standard Fruit Company (now Dole) (United States) for seriously polluting Costa Rica's Atlantic region through its banana operations in the Valle de la Estrella (Arias et al., 2003). In the 1990s, Del Monte, Dole and Chiquita were sued by ex-workers for injuries resulting from their exposure to a nematicide (Nemagon) during the period 1965–1990. The TNCs in the banana industry also came under increasing criticism from NGOs concerned with human rights and environmental issues. That, as well as pressure from shareholders, as the concept and practice of corporate social responsibility became more common (chapter

V), forced TNCs in banana production in Latin America to improve their social and environmental performance (Arias et al., 2003). Market factors, such as oversupply, fierce competition, the pressure of retailers and changing consumer preferences, also motivated TNCs to differentiate products to retain their market share by offering "environmentally friendly" and other types of "ethical" bananas as a means of attracting more consumers.

Environmental standards and certification have come to play an important role in inducing TNCs to turn to more environmentally friendly production methods and practices in their banana plantations in response to growing criticism and environmental concerns. Initially they established their own standards and increasingly are conforming to standards established by outsiders. However, the TNCs embraced environmental certification somewhat reluctantly, because their culture of secrecy made it difficult for them to collaborate with civil society organizations.[53] Subsequently, they increasingly came to recognize that certification not only improved their corporate image, but also permitted cost reductions through lower use of inputs, recycling and other factors. Collaboration with NGOs and independent certification programmes has helped reduce criticism of TNCs, but not entirely; their certification initiatives have not yet convinced many critics. They still need to demonstrate real progress towards environmental (and social) sustainability of their banana production operations (Arias et. al., 2003).[54] Moreover, with TNCs starting to produce in a more sustainable manner, the attention of environmentalists has turned to their independent suppliers.

Floriculture in Kenya. TNCs play an important role in export-oriented horticulture in a number of developing countries,[55] including the growing of flowers and vegetables. In Africa, Kenya is a major host for TNCs in floriculture (section B.5.b).[56] Nearly 50% of the country's flower production is estimated to be concentrated around Lake Naivasha, making it the hub of the country's flower industry. A shallow basin lake situated 80 kilometres north-west of Nairobi in the Kenyan Rift Valley (Becht, Odada and Higgins, 2005), Lake Naivasha is an important freshwater source that supports a rich ecosystem, and is a base for a variety of economic activities that have sprung up over time.

The continuing growth of flower farms around the lake since the early 1980s, and the associated increase in population and unplanned settlements, has caused concern about the capacity of the lake to sustain the increased demand on its resources. It has given rise to disputes between conservationists and commercial growers on a variety of issues, such as the volume of water extraction and the effects of deforestation. These concerns and disputes led to an initiative to study the lake's water balance and the water-related environmental impacts of activities in the surrounding area. This initiative was spearheaded by the Lake Naivasha Riparian Association (LNRA), an organization of landowners and others interested in managing the lake and its sustainable development (Becht, Odada and Higgins, 2005).

In addition, the Lake Naivasha Growers' Group (LNGG), established by the large flower farms, also began to realize that overexploitation of the finite natural resources would damage the entire flower industry. The fact that developing a reputation for environmentally friendly production is an asset in their main European export markets also encouraged the LNGG to become a more active partner in lake management. As a result, it has been working with LNRA on issues such as land tenure, abstraction rates, agrochemical controls and water availability.

The Oserian Development Company (Netherlands) is an example of a TNC in Kenyan floriculture that has adopted a number of improved, environmentally friendly technologies and practices. For example, the company introduced hydroponics to cut back on water usage, and it generates three quarters of the energy it uses from geothermal springs.[57] Max Havelaar (which awards the Fairtrade label), Oserian's retailers (e.g. supermarket chains) and a local team (created by Oserian and other local growers) are allowed to inspect the company at any time (Coglianese and Nash, 2001).

Due to pressure from environmental and human rights groups as well as consumer demands, the flower farms in Kenya have been opening up to the public and there is a horizontal flow of information among them (Bolo, 2008). Regular environmental and social audits are conducted to ensure that the farms not only conform to good agricultural practices (GAPs), but also maintain environmental standards and favourable working conditions for their workforce. Compliance is enforced through codes of practice and certification by industry associations such as Kenya Flower Council, Fresh Produce Exporters' Association of Kenya, Horticultural Ethical Business Initiative, LNGG, LNRA and the Kenya Bureau of Standards. Notwithstanding the positive steps and practices mentioned above, the sustainability of the extensive TNC-led cut flower industry on Kenya's Lake Naivasha under present conditions has been questioned (Becht, Odada and Higgins, 2005; Loukes, 2008). Some of the concerns arise from the lack of institutionalization of the management plan for the lake and shortage of funds and experts in scientific management.

Soya Beans in Latin America. While the cases of banana plantations and floriculture discussed above throw light on evolving trends in environmental management and the impacts of TNCs operating

directly in agricultural production, the impact of TNCs in downstream and upstream activities along the agribusiness value chain in host countries may also have significant environmental consequences. By influencing the scale of production and the variety and quality of agricultural products, TNCs that supply seeds and other inputs and purchase output for processing and/or distribution can affect land use and other input use and production patterns, and thereby various aspects of the environment. For instance, in the cultivation of soya beans – a major source of animal feed – transnational trading companies and seed suppliers have had a significant influence on the size and nature of farming. Their involvement has led to a major expansion of production and to a shift to large-scale farming in South America. This has raised concerns about the impact in terms of deforestation of the Amazon biome (the Amazon rainforest and its related ecosystems), especially in Brazil, the second largest producer of soya in the world.

The land devoted to soya cultivation currently consitutes only 0.3% of the Amazon biome, and is therefore perhaps a negligible factor in its direct deforestation. However, this could change if the profitability of soya farming continues to increase. Moreover, it can be an important indirect driver of deforestation, mainly by displacing cattle ranching which has been pushed to expand into the Amazon (Verweij et al., 2009). The expansion of soya production has also involved the use of a GM variety of soya ("Roundup Ready" soya), which may have some positive impacts on the environment, because it is resistant to and thus enables the use of glyphosate (known commercially as "Roundup"), a herbicide that enables a no-tilling system of farming thus reducing soil erosion by controlling the serious weed growth that such a system generates.[58] However, there are concerns that the application of this herbicide may also have environmental and health consequences, and that the GM variety could be potentially damaging to the environment due to the uncertain impacts of the release of genetically modified organisms into nature. More generally, the agrochemicals (pesticides and herbicides) involved in large-scale soy cultivation have raised concerns about their impact on biodiversity and health.[59] In response to pressure from environmental groups, leading soya processors and exporters operating in Brazil, including ADM, Bunge, Cargill and Monsanto, signed an agreement in July 2006 committing themselves to refrain from purchasing soya from lands that have been deforested in the Amazon biome.[60] The TNCs mentioned above are also members of the Round Table on Responsible Soy Association that is developing a set of standards for the production and sourcing of socially and environmentally responsible soya as well as a verification mechanism.[61]

Overall, there is little statistical evidence from studies on a range of industries to show that foreign firms consistently perform better than domestic ones in terms of their environmental impact in developing countries, especially when firms' size is taken into account (UNCTAD, 2002b). However, firms in agriculture as well as other industries – both domestic and foreign – appear to be incrementally improving their environmental performance in many parts of the world, primarily in response to effective national regulation and/or community pressure (Zarsky, 1999), but also, as illustrated by the experience with respect to TNCs involved in the specific agricultural crops described above, because of a growing awareness of the benefits of such improvements to the firms themselves.

2. Social effects and political implications

Issues and concerns about the social and political implications of TNC participation in agriculture have a long history (George, 1976; Vallianatos, 2001). First, there are concerns about the involvement of TNCs in the political process of the host country. Second, TNC-induced transformation of agriculture may have an impact on income distribution (e.g. by gender and farm size) and poverty in rural areas in a number of ways. Finally, a range of socio-political externalities can arise, such as the disruption of traditional economic systems, and impacts on health and safety as well as on land rights.

TNCs' impact on the political process. Concerns about the political involvement of TNCs engaged in agriculture are not confined to instances of blatant interference, such as support for sympathetic regimes or agrarian elites in parts of Latin America or Asia (Burbach, 2008; Franco and Borras, 2005). Lobbying by TNCs may also have impacts that are detrimental to the broader interests of the host country. For instance, the United Nations Special Rapporteur on the Right to Food notes: "As financially powerful lobbying groups, corporations can also exert great control over laws, policies and standards applied in their industries, which can result in looser regulation and negative impacts on health, safety, price and quality of food" (United Nations, 2003). These concerns are particularly relevant in countries where the governance structure is weak. Such lobbying may also take place at the international level. The Special Rapporteur notes that "the FAO/World Health Organization Codex Alimentarius Commission, which sets international standards for food safety recognized by WTO, is criticized by civil society organizations for failing to include the participation of small producers and consumers, and being heavily influenced by the

lobbying and participation of large agribusiness, food and chemical corporations" (United Nations, 2004).

Impact on income distribution and poverty. Commercialization of agriculture can drive small-scale farmers out of the supply chains (section B.4), even while consumers benefit in general, as do farmers who succeed in adapting to the modern supply chain management techniques of agribusiness TNCs. Thus, even though the economy as a whole might gain from TNC involvement, it might exacerbate rural poverty (Berg et al., 2006; Haggblade, Hazell and Reardon, 2009). Clearly, FDI in any industry could have such distributional impacts, but what is of particular concern about FDI in agriculture is that the majority of poor people live in the rural area and could be the worst affected, thus widening income gaps even further. Furthermore, in many developing countries, rural inhabitants exercise less political influence on their national government than urban dwellers, thus attracting less public action to address their problems. Yet it is possible to reduce or even reverse these negative impacts by investing in capabilities (e.g. the skills needed to participate in global, regional and domestic value chains) and facilities in rural areas (Berg et al., 2006; Hoeffler, 2008).[62]

The distributional impact has a significant gender aspect as well. For instance, traditional retail markets have provided income-generating opportunities for peasant farmers, especially women. The loss of these markets (as discussed in section B.4) would deprive them of their source of income. Women can also lose out more than men through the processes associated with commercialization, often driven by TNCs. For instance, in many countries and cultures there are restrictions on women's mobility or the jobs they can undertake, or they are denied educational and other rights; in others, women bear the main responsibility for household subsistence (World Bank, FAO and IFAD, 2009b). At the same time, under the right conditions, women can benefit from the involvement of TNCs in agriculture. For instance, in Ghana, the development of an export-orientated value chain in exotic mangoes has given women opportunities to expand their activities into wider distribution channels (Berg et al., 2006).

Furthermore, increased investment in some agricultural industries through TNC participation may create relatively more employment opportunities for women. Commonly, this is in export-oriented products, such as cut flowers and vegetables (Wee and Arnold, 2009; Hurst, Termine and Karl, 2005), though the impact on women – and other workers – is often mixed. In Kenya, women in flower cutting jobs were (and in some cases still are) illegally treated as casual or temporary workers, which reduced their rights and bargaining power, and thereby their incomes and other benefits (UNCTAD, 2008e). Context matters, but overall, in order to empower women in agriculture – especially where commercialization is rapid and the involvement of TNCs intensive – it is important to strengthen their control over and ownership of assets, ranging from human capital to property rights (Quisumbing and Meinzen-Dick, 2009).[63]

Socio-political externalities. Socio-political externalities, or unintended consequences, can be both positive and negative. There can be extensive repercussions for the existing social and political order arising from TNC involvement in agriculture and rural communities. This aspect is important, because economic institutions can function only as part of an often elaborate social, political and cultural context. As such, disruption of an existing system due to the transformation of agriculture may have unpredictable consequences, even if it is progressive and benefits the poor in the long run. For example, many rural communities rely on a local system of credit that operates through traditional markets. The loss of those markets therefore disrupts the system of credit, causing financial problems for the communities. A study on a major TNCs' direct procurement of produce from farmers in Indonesia showed that while traditional credit systems can be exploitative, they nevertheless provide farmers with capital needed for non-farm expenses (Clay, 2005).

Positive externalities can also arise, for instance where the rural community can take advantage of capabilities, facilities or institutions provided or created by TNCs to realize their own objectives.[64] Rural roads are a good example: communities connected to markets are also able to use the infrastructure for other purposes or objectives, and, importantly, to achieve them faster (Hettige, 2007).[65] Other examples of socio-political externalities are effects on the health of rural communities, which can be negative or positive. The detrimental effects of agricultural pesticides – often required to be used in the context of TNC involvement, among others – on the health of workers and communities is an important and politically sensitive issue of long standing (Carvalho, 2006). In contrast, some recent research shows that the health of farmers growing organic produce – also induced in many cases by TNCs – is better than that of farmers that use conventional methods (Setboonsarng and Lavado, 2008).

Land acquisitions and land rights.[66] A number of large-scale land deals in developing countries in recent years, both to grow crops for food (e.g. by developing home countries as part of their food security strategies) and for other purposes (e.g. feedstock for biofuels) (chapter III), have prompted protests/vociferous debate over so-called "land grabs" (Hallam, 2009; Smaller and Mann, 2009; von Braun and Meinzen-Dick, 2009). At first sight, such a response is surprising: after all, land is frequently

acquired by foreign investors in developed as well as developing countries. Some companies use the land to establish factories; others need it to create infrastructure facilities such as ports and their hinterland operations; in yet other cases, mining operations are impossible without a certain amount of land for locating extraction activities and housing ancillary activities; and, of course, many agriculture-based companies operate huge plantations and farms. In this sense, the acquisition of land to produce agricultural commodities – food or non-food – for export or local sale, or for inputs within an agribusiness value chain, is not in itself remarkable. Moreover, despite the number of putative deals, there are only a small portion of them that are actually implemented, and they are primarily in the form of leases rather than outright ownership of land (chapter III).

There are, however, two major underlying issues which give credence to the concerns voiced. First, although it may be too early to say what the overall impact of these recent large-scale investments might be, the little evidence amassed thus far – for instance by looking at deals and their aftermath in a few countries in Africa (Cotula et al., 2009) – indicates that host governments have usually not negotiated favourable contracts (due to the weak institutional capacities), the process of negotiation and implementation is normally not transparent (stakeholders' views are seldom solicited or considered) and post-deal compliance structures are inadequate. Under such conditions, it is fair to conclude that the sensitive balance between the positive and negative impacts of TNC participation may well be skewed in favour of the latter. Furthermore, it is important to note that most large-scale land deals take place in LDCs or other poor countries such as the Democratic Republic of the Congo, Ethiopia, Liberia, Mali, Mozambique, Sudan and the United Republic of Tanzania (figure III.14) – countries which are themselves facing severe food insecurity (FAO, 2008c). It is not clear whether large-scale land deals help or hinder food security in such countries (section C.3), a concern which needs to be addressed by appropriate policy measures (chapter V).

Secondly, aside from large-scale land acquisitions, TNC participation in agricultural production – even in wealthier developing economies – has implications for land rights enjoyed by host-country communities. In countries where TNCs are in the vanguard of commercial agriculture, their involvement accelerates the process of reform pertaining to property rights, including those with respect to land. The granting of enforceable rights increases the chances of investment by TNCs and other firms (domestic and foreign), and may unlock the productive potential of land, but it comes at a cost, namely the loss of rights of individuals, groups and communities if they are not properly compensated (CAPRi, 2006). TNCs are both drivers for land reform and beneficiaries, which creates the temptation for introducing reforms that benefit TNCs, other domestic and private companies and State allies, often with anti-poor consequences (Borras, Carranza and Franco, 2007). Thus, even though land reforms may be essential for the longer term development of a country, it is important that they be introduced in a fair, reasonable and transparent manner (chapter V).

Overall, the social and political impacts of TNCs' involvement in agriculture on host countries, and especially on agricultural and non-farm rural communities can be considerable. There are too many different factors combined to permit definitive or general conclusions. However, the above discussion does indicate that, given the significant impacts, governments need to consider at the outset how best the transformation of agriculture and rural communities can be brought about. This would include ensuring effective linkages of TNCs with communities and examining carefully the resources used and changes created or induced by TNCs to make sure that they are in line with national development goals and trajectories (Haggblade, Hazell and Reardon, 2009).

3. Implications for food security in host and home developing countries

Food security is not simply a matter of ensuring the sufficiency of food crops for a particular population or country. Food security is compromised if, for example, households do not have the income to buy food, or if the infrastructure to transport it to the necessary locations is not available, or if it is not safe to eat. This broader concept of food security is commonly accepted (Pinstrup-Andersen, 2009), and is captured in the FAO's definition, which requires the following conditions to be met: availability of food, access to food, stability of supply, and safe and healthy utilization (FAO, 2008c; figure IV.2). These dimensions are relevant for all developing countries, whether they are host to TNCs in agricultural production or home to such TNCs.

a. Implications for host countries

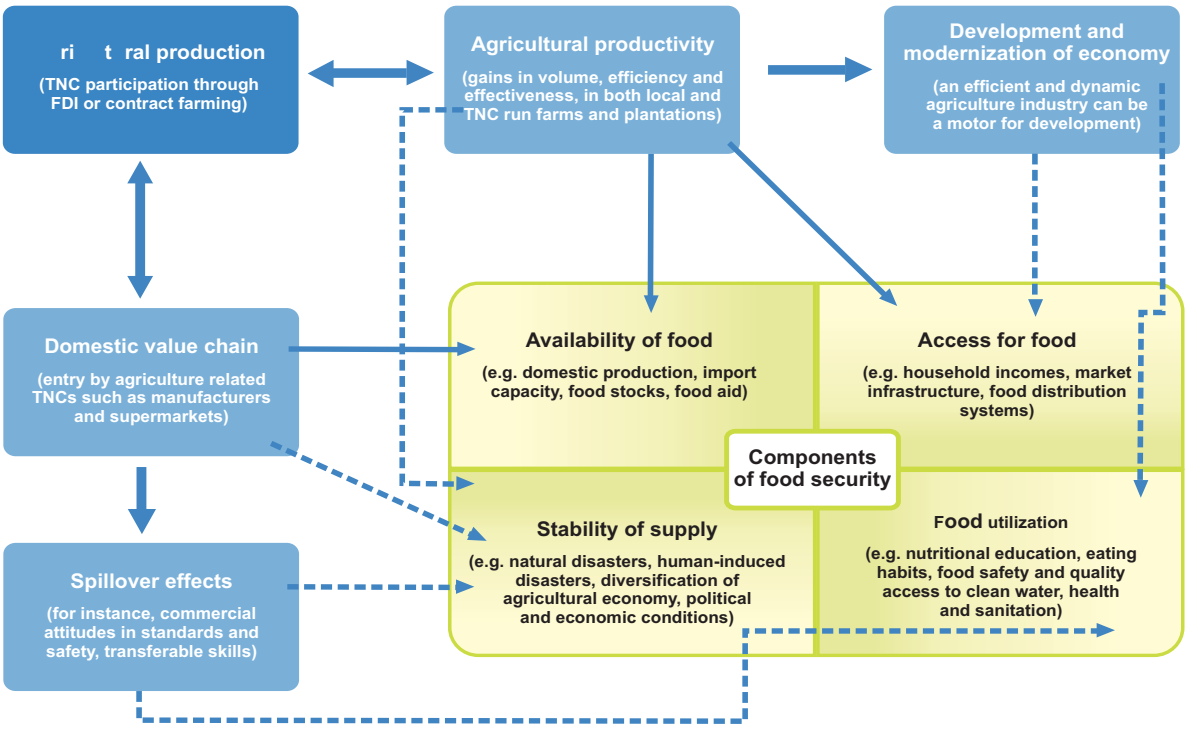
The implications of TNC participation in agricultural production for host developing countries derive from its various impacts on agriculture and the wider economy discussed in section B and earlier in this section. Given that TNC involvement is not motivated by host-country food security concerns, the impact on food security can be highly variable, not least in terms of the four dimensions mentioned above. Nevertheless, since TNC involvement in

agriculture inevitably affects aspects of food security (figure IV.2) – both positively and negatively – it is important for governments to be aware of the key types of impacts that occur so that they can design their policies appropriately, including establishing conditions under which food security could be enhanced.

Availability of food. The foremost dimension of food security is the domestic availability of food crops, and in this respect TNC involvement in agricultural production is likely to increase the overall volume of production of certain crops. However, much of this production may be for exports (section B.5); moreover, a large share tends to be in high-value-added cash crops which are normally not the staple foods of the host countries concerned (chapter III). In addition, there is the danger that TNC involvement may adversely affect smallholders or other farmers, either through direct competition in product markets (sections B.6) or through alternative uses for land, water and other resources (e.g. by companies involved in biofuel production) (FAO, 2008c) or, indeed, food crops for export, thereby reducing the volume of food supply available for domestic consumption. Dynamically, TNC involvement can have a positive impact on the production of food crops. In particular, learning effects and productivity gains to local farmers (especially through contract farming) resulting from the transfer of agricultural technology, modern management techniques and knowledge of supply chain management can improve the capacity of local agricultural producers. Under the right conditions, host-country farmers can apply the knowledge they gain to food crops other than the ones they produce under contract to TNCs. Moreover, demonstration effects can bring new producers into agricultural production.

Access to food. As with food availability, the impact on access is mixed. It is possible for a vicious circle to be established, whereby improved productivity can lead to falling employment, lower household incomes for some farmers and a negative effect on the non-farm rural economy (section B).[67] However, much depends on the overall volume of increase in food and non-food crops and the linkages created, which may maintain income levels. Arguably, the overall issue is one of transition, and how governments manage the process of channelling the productivity gains (be this through TNC involvement or other sources of investment) in order to modernize their agriculture (chapter V). If a more productive agricultural industry can be used to boost the development process – as in Brazil, China and India (Neves, Pinto and Conejero, 2009; Nsonzi, 2009) – then rising urban and rural incomes will improve access to food. Inasmuch as TNCs largely export the crops they produce or contract out, they require infrastructure – whether established by the TNCs

Figure IV.2. TNC participation in agricultural production and impact on food security



Source: UNCTAD.
Note: The line arrows indicate selected immediate and longer term consequences of TNCs participation in a developing country's agricultural industry on food security, through various rutes of impact. The dashed arrows indicate that the impacts are indirect and difficult to quantify. In principle the impacts can be net negative or positive, depending to a great extent on conditions and policy.

themselves or by the host government – connecting producing regions to ports. This helps improve access to food for urban areas, and to rural areas as well if there is a shortage which can be resolved through imports or intra-country shipments.

Stability of supply. Apart from the above-mentioned increased agricultural capacity in host countries resulting from productivity increases, TNC involvement in farming and plantations is unlikely to have a direct impact on the stability of food supply. However, depending on the economy, a key beneficial spillover effect on supply stability is the diversification of agriculture, arising from new crops being introduced by TNCs or from the use of knowledge gained by farmers in new fields. However, a contrary effect is illustrated by the danger of monoculture production leading to greater risk from disease and natural disasters (section C.1). Depending on government policies, the entry by agriculture-related TNCs (chapter III), such as manufacturers and supermarkets, into the domestic value chain may lead to enhanced stability of supply. These companies have the ability and motivation to ensure stability of food supply for their customers. For example, in times of shortage, they have both the distribution channels to import food and the financial means to pay for it.[68]

Food utilization. Agribusiness TNCs can introduce higher quality and safety standards and associated practices (such as those related to traceability) to host developing countries (section B.4; Wong, 2009). Their involvement in agricultural production and the domestic value chain has a number of spillovers to local farmers and other companies, such as those related to quality control, food standards and consumption patterns. Thus, for instance, knowledge of food safety and quality standards applied to TNCs' customers, many in developed countries, but increasingly in developing economies as well (Gereffi and Lee, 2009), can spill over into food utilization in poorer countries. However, by the same token, the food consumption patterns of developed-country populations – emulated in developing countries and sometimes induced by TNC entry into the local food chain (as with "fast food") – can be very unhealthy, in contrast to traditional eating habits (FAO, 2004c; Pimbert, 2009).

b. Implications for home countries

As mentioned in chapter III, a number of developing countries, notably the GCC countries and the Republic of Korea, have recently established or reinforced their national food security strategies through investment in agricultural production abroad, principally targeting staples such as rice and wheat for consumption in their own domestic markets. In terms of the four main components of food security, their key objective is to ensure stability of supply (especially in view of market volatility and export bans by the principal trade partners). In some cases, a number of countries are shifting production of crops overseas because of scarcity of land and – most importantly – water resources in their own countries (chapter III).

It is too early to determine what the effects of such recent FDI in agriculture will be on developing home countries' food security. However, similar past investments in overseas agricultural production undertaken for food security reasons were mostly unsuccessful, as in the case for the Republic of Korea in the 1960s, 1970s and 1990s, and some GCC countries in the 1970s. One reason was that agriculture is among the most sensitive and thus most regulated industries in host countries; while on the side of the home country, inappropriate policies, inexperience, lack of understanding by investors of local culture and customs, low productivity and profitability of investments contributed to the failures, as in the case of the Republic of Korea. Another problem has to do with the fact that investment return periods for overseas agricultural investment are comparatively long, while the required initial investments can be huge because of the need to develop new arable lands and agricultural infrastructure such as irrigation and transportation facilities (Sung, 2008; Republic of Korea, MIAFF, 2008). The story is similar for overseas agricultural investments by GCC countries. Apart from political instability in the host countries (e.g. civil war in Sudan, a significant recipient of GCC agricultural FDI), financial, technical and institutional problems caused most of these investments to fail. Many of the investors, whether private or State/State-backed, were relatively small and inexperienced, as they are even today. Compared to the magnitude of the food gap in GCC countries, their overseas investments in agricultural production in the 1970s and 1980s remained small: they were seldom little more than pilot projects. Indeed, the heavily subsidized agricultural developments in the GCC countries themselves, most notably Saudi Arabia, led to an explosion of production in crops which far exceeded their overseas production (Woertz, 2009; Nur, 2009).

Although the past experience of developing home countries in overseas agricultural investments for food security does not bode well for the latest wave of such investments, it is worth mentioning that there are significant differences between the investment environment of the past and the present. This may result in a more successful outcome for home-country food security from those investments than from previous ones. First, many home countries see the latest changes in the global agricultural industry

as a sea change from the past, with high prices, shortages and volatility in food crops persisting into the future (e.g. because of competition for the same resources from the biofuels industry). Thus success in these investments is imperative. Secondly, host countries today are generally more open to such investments, thereby reducing risks and increasing the possible benefits arising from agglomeration and scope: more investments in agriculture, including by other TNCs for different reasons, creates the basis for a more effective infrastructure, including linkages with upstream industries. Thirdly, home countries are recognizing that the heavily subsidized domestic agriculture of the past is no longer viable, and are more willing to explore these and other business models to ensure food security (chapter V; Hallam, 2009).

D. Conclusions

A precisely quantified evaluation of the impact of TNC involvement in agriculture on important development aspects, such as its contribution to investment, technology transfer and foreign market access, is hindered by the limited availability of relevant data collected by national authorities and international organizations. The actual impact and implications vary greatly by country and type of agricultural produce (especially between cash crops and staple foods). Nevertheless, a number of salient observations on the implications of TNC involvement in agriculture for developing countries do emerge.

FDI can help fill the investment gap in agriculture in developing countries, which is crucial for increasing production capacity and output (section B.1.a). To date, however, TNCs in general have not been major sources of investment or finance for agricultural development in the developing world, though in a number of countries their contribution is significant in both absolute and relative terms. Perhaps, more importantly, TNCs' contractual relationships with local farmers can have an important beneficial effect on agricultural development by easing their financial constraints (section B.1.b). Through contract farming, foreign affiliates can provide credit to farmers, which is a possible solution to the persistent problem of lack of financing in rural areas.

The limited role of TNCs in agricultural investment does not mean that their impacts on agriculture are insignificant. On the contrary, for instance, TNC participation in agricultural production provides effective channels of technology transfer and dissemination (section B.2). Evidence from case studies suggests that the involvement of different types of TNCs, including seed companies and other input providers, plantation companies and food processors, brings a variety of useful technologies to developing countries that may not otherwise be locally available. Further, when TNCs undertake R&D locally, they become players in the local agricultural innovation system and influence its structure and performance. However, the scope of concrete technological contribution of TNCs has generally been limited. In particular, it remains marginal in most low-income countries and for many important agricultural products, especially food staples.

Various trade barriers and subsidies in developed countries limit the scale and scope of agricultural exports from developing countries. Furthermore, their comparative advantages based on factor endowments are not a sufficient condition for them to increase agricultural exports. By providing the "missing ingredients", such as established brand names, distribution channels and marketing skills, TNCs can help developing countries exploit their comparative advantages, access foreign markets, build export competitiveness and expand agricultural exports (section B.5).

The transfer of advanced technology, the enhancement of farmers' skills (section B.3) and the introduction of standards and modern supply chain management (section B.4) help improve labour productivity, while better irrigation and land management, improved seed varieties and soil fertility increase land productivity. In addition to greater efficiency in the production of existing crops, especially traditional export-oriented commodities, TNCs can contribute to the introduction of new, high-value-added commercial crops that might otherwise not be possible, at least in the short run. All these factors are conducive to fostering competitiveness in agriculture and to promoting sustainable and pro-poor agricultural development. Indeed, TNC involvement in agriculture has contributed to enhanced productivity and output in a number of developing countries, and in some instances boosted employment and incomes.

However, the evidence also highlights the need for host developing countries to be particularly aware of the negative consequences that can arise from TNC participation along the agribusiness value chain. For instance, direct TNC involvement may crowd out domestic investment (section B.1), displace small farmers (section B.4) and create market power, leading to an adverse bargaining position for domestic producers and, thereby, to an unfair distribution of economic benefits (section B.6). These may cause a deviation from the host country's objective of developing its agriculture and increasing farmers' incomes. Not all farmers benefit from TNC involvement. Some may not be able to work in a plantation or participate in contract farming schemes, and therefore could become marginalized. Others may become economically worse off due to the competitive pressure from foreign affiliates engaged

in farming the same crops. Such issues raise various social and political concerns in developing countries, particularly when TNCs own or control large tracts of agricultural land (section C.2). In terms of the environmental impact, case studies show that TNCs have the potential to bring environmentally sound technologies, but their impacts through extensive farming have also raised doubts, including on their effects on biodiversity and water usage (section C.1).

The actual impacts of TNC participation vary greatly across countries and types of agricultural goods, and are influenced by a range of factors, especially the mode of TNC involvement and the host-country institutional environment. The beneficial effects have been observed more in high-value-added commercial products than in traditional cash crops, and much less in basic foods. Generally, it is still unclear to what extent TNC involvement has allowed developing countries to increase its production of staple food and improve food security. Available evidence points to TNCs being mostly involved in the production of cash crops, and rarely staple food crop. (It is still too early to assess the likely effect of the recent rise of South-South FDI in this area.) However, it should be recognised that food security is not just about food supply: TNCs also have effects on food access, stability of supply and food utilization and, in the longer run, their impacts in these aspects of food security are likely to prove more important (section C.3).

With regard to the mode of TNC involvement, evidence from many developing countries shows that through contract farming host countries can receive most of the benefits related to TNC participation, while avoiding a number of negative consequences. Contractual links between foreign affiliates and local farmers can help the latter overcome technological barriers and move into higher value-added products, link up with global markets, and, consequently increase their income. The terms of a contract are extremely important in determining the value retained in host countries and the economic benefits received by local farmers, and they generally reflect the relative bargaining power of farmers vis-à-vis foreign affiliates. How farmers are organized and what policies and institutional arrangements concerning contract farming are in place largely influence the net outcome. In general, a sound policy and institutional framework is crucial for maximizing the benefits while minimizing the costs associated with TNC involvement (chapter V).

Overall, TNC involvement in developing countries has promoted the commercialization and modernization of agriculture. They are by no means the only – and seldom the main – agents driving this process, but they play an important role in a significant number of countries. They have done so not only by investing directly in agricultural production, but also through non-equity forms of involvement, mostly contract farming. They have contributed, in many cases, to significant transfers of skills, know-how and methods of production, facilitated access to credit and various inputs, and given access to markets to a very large number of small farmers previously involved mostly in subsistence farming. Nevertheless, governments need to be sensitive to the above-mentioned negative impacts of TNC involvement in their agriculture, with the aim of avoiding or minimizing them.

Notes

1 The ratio of agricultural FDI stock to agricultural GDP in developing countries is also small – only 1% in 2005, compared to 26% in manufacturing GDP and 33% in services GDP.

2 For example in India, 87% of the surveyed households had no access to formal credit and 71% had no access to a savings account in a formal financial institution (World Bank, 2007).

3 Difficulties in financing small farmers are due to their lack of ownership of assets which could serve as collateral for credit. Where assets are owned, there is a reluctance to use them as collateral, as they are vital for livelihoods. The development of microfinance, which provides access to credit without formal collateral, overcomes this problem, but this form of finance is still in its infancy and has not yet reached most agricultural activities.

4 Since credit can be abused by farmers through selling crops to outsiders or using material inputs for purposes outside the contractual obligations, many contracts include provisions relating to the use of the credit provided.

5 However, the current economic crisis appears to be reducing the availability of finance. For example, Bunge cut advance cash payment to Brazilian farmers by 70% in 2008 ("In Brazil, credit to farmers dries up", *The Wall Street Journal*, 29 November 2008).

6 For example, public breeding programmes in developing countries have released more than 8,000 improved crop varieties over the past four decades (Evenson and Gollin, 2003). In China, based on public research, high-yielding, hybrid rice was commercialized in 1976 and has contributed significantly to productivity growth since then. In Brazil, Embrapa, the leading public agricultural research institute, has generated more than 9,000 technological improvements since its establishment in 1973.

7 The global system for supplying improved agricultural technologies to farmers has been transformed by three interrelated forces: (i) the rapid pace of discovery and growth in importance of molecular biology and genetic engineering; (ii) the strengthening of intellectual property legislation in plant innovations; and (iii) more open trade in agricultural inputs and outputs in nearly all countries. These developments have created a powerful new set of incentives for private R&D investment and altered the structure of the global agricultural innovation system, particularly with respect to crop improvement (Pingali and Traxler, 2002).

8 The importance of inventive adaptation for technology progress and productivity gains was first emphasized by Griliches (1957).

9 See, for example, Pingali and Raney (2005).

10 There are several major modes of international technology transfer in the agricultural sector, apart from FDI and non-equity forms of TNC participation. International

trade in agricultural products is one such mode: it opens channels of communication and introduces incentives to innovation by enlarging market size. It also induces patterns of specialization that influence productivity growth (Coe and Helpman, 1995). In addition, many new technologies can reach local farmers through various marketed inputs, including seeds, fertilizers, pesticides and machinery. Technologies can also be imported by licensing and other forms of technology trade.

11 See UNCTAD (2005) for examples.

12 CSFAC and the Guinea Ministry of Agriculture co-founded the Sino-Guinea Agricultural Cooperation and Development Company and Koba Farm. In 2003, Chinese experts successfully conducted high-yield breeding and cultivation experiments in Guinea (see "Fruitful agricultural cooperation", at: www.china.org.cn).

13 Previously, during the 1970s, there had been considerable technological innovation, with the substitution of Gros Michel by Cavendish varieties, the boxing of bananas and overhead cableways for fruit transport, all of which reduced production costs, increased production and lowered world prices (Arias et al., 2003).

14 The research involved interviews with four leading foreign affiliates of TNCs in the food processing industry in India: Pepsi Foods Ltd., GlaxoSmithKline Beecham Ltd., Nestlé India Ltd. and Cadbury India Ltd. (*WIR01*).

15 Ranging from tractors and combine harvesters to airborne spraying techniques.

16 See, for example, Dutfield (2003).

17 The research centre will employ up to 200 scientific and technical personnel, once its laboratory facilities are established and functioning in 2011. The establishment of the R&D centre makes Syngenta the first foreign agribusiness to set up a global R&D institute in China (*Source:* field study conducted by UNCTAD).

18 A major difference between developed and developing countries with regard to the structure of their agricultural innovation systems is that in developing countries the public sector plays a much more dominant role. Whereas in developed countries, private investment accounts for over half of R&D in agriculture, in developing countries as a whole the share is only 6%. In most low-income countries, the bulk of it is done in universities and government research institutes, sometimes with few, if any, linkages with producers. Where R&D is undertaken by TNCs in host developing countries, it compensates to some extent for the absence of innovative enterprises, which is a common weakness in their agricultural systems.

19 Those who work in agriculture include wage earners (such as permanently employed workers, seasonal or casual workers and migrant workers), self-employed, unpaid family members and others (e.g. cooperative workers) (ILO, 2008).

20 See: www.fairtrade.org.uk.

21 See: the *Informer Newspaper Liberia*, "Malaysian investors take over Guthrie as Ellen signs $800 mn deal", 1 May 2009.

22 In the case of coffee, for most producing countries (with the notable exceptions of Brazil and Ethiopia), virtually all demand comes from abroad through international trading houses and roasting companies.

23 Kyagalanyi Coffee Limited is an affiliate of ED&F Man Holdings based in the United Kingdom.

24 This refers to PTP Group, a joint venture between Asia Timber Products (Singapore) and the local government. (The information on employment is provided by the Ministry of Commerce of China.)

25 A substantial body of literature shows the importance of non-farm enterprises as engines of rural development, and their role in income growth and poverty reduction (see, for example, World Bank, 2006).

26 Decent work is about opportunities for women and men to obtain productive employment in conditions of freedom, equity, security and human dignity (ILO, 2008).

27 Depending on their size, technological advantage and country of origin, foreign affiliates have been observed to offer higher remuneration and better conditions of work than domestic firms, in both developed countries (OECD, 2001) and developing countries (*WIR94*).

28 The Kenya Flower Council, whose members include more than 50 floriculture companies, has developed a code of practice, backed by regular audits, with requirements concerning workers' health and safety, general worker welfare and various other labour-related issues.

29 For example, structural overproduction, greater competition and declining prices have been responsible for permanent workers being replaced by migrant and/or contract workers, the increasing employment of under-age workers, and a deteriorating quality of life for workers and small farmers in producing countries.

30 A number of factors suggest that the impacts of transnational food processors can be significant. First, a large proportion of the food sold in supermarkets is in the form of processed products supplied by food processors. In general, farmers have a more direct link with food processors than supermarket chains or specialized procurement agents acting on their behalf. Secondly, entry costs for small-scale farmers supplying processors tend to be lower. Since food processors generally have less exacting quality standards, they can accept supplies from more marginal producers who tend to be excluded from the value chains of fresh produce for export or for supermarkets. Finally, the scale of production contracted or bought by processors is often much larger than for supermarkets. Therefore, food processors play an important role as intermediaries with direct contact with local farmers, and, as such, influence both the quantity and quality of agricultural production by the farmers involved.

31 In Latin America, which is the most advanced region in this regard, their share already exceeds 50% in many countries. Asia and Africa lag behind, but a number of the more developed countries and urban centres in these regions are catching up fast (Reardon, Henson and Berdegué, 2007).

32 For a detailed discussion on private grades and standards, including how their role has evolved over time, see Reardon et al., 2001.

33 Freshmark (South Africa) and Hortifruti (Costa Rica) are among the better known transnational procurement agents.

34 In some developing countries where written contracts are rare, these kinds of contracts are often informal, but nevertheless effective.

35 More recent evidence suggests that smaller retailers are showing more resilience in the face of competition from transnational supermarket chains. In Brazil, for example, the share of transnational supermarket chains has levelled off after years of expansion. This is attributed to two main factors. First, smaller shops have begun to collaborate in their procurement to gain stronger bargaining power in dealing with suppliers. It also helps that they now have access to the technology used in modern retailing. Second, food producers have recognized the importance of smaller retailers, and provide them with some preferential treatment so as to avoid too much concentration in the hands of a few supermarkets. These factors, coupled with their "natural" advantage that they are typically established at convenient locations, appear to have given a new lease of life to smaller shops.

36 As noted in one study, "a comparative advantage in producing a good does not necessarily imply a comparative advantage in marketing it." One of the reasons is that marketing and trading functions are knowledge- and skill-intensive – more skill-intensive than, for example,

producing simple, labour-intensive manufactured goods (UNCTC, 1989: 120). It should be noted that a number of developing countries established State-owned companies in the past to deal with the marketing of agricultural commodities, among others. These companies often came to be criticized for their lack of efficiency and poor management, resulting in lower prices paid to farmers and a fiscal burden on State budgets. In the late 1980s and 1990s, many of these agencies were abolished or restructured (World Bank, 2007). A number of countries have tried to develop alternative marketing channels for their agricultural exports, but only some have succeeded.

37 Moreover foreign markets are also very demanding. This is due not only to intensifying competition among supermarkets and changing consumer tastes, but also to emerging food safety regulations (e.g. strict sanitary and phytosanitary standards) as well as growing attention paid by consumers in developed countries to fair trade issues, including working conditions of suppliers. In general, the so-called "credence goods" in the food industry have been gaining in importance. "The quality and safety characteristics that constitute credence attributes include the following: (1) food safety; (2) healthier, more nutritional goods (low-fat, low-salt, etc); (3) authenticity; (4) production processes that promote a safe environment and sustainable agriculture; and (5) 'fair trade' attributes (for example, working conditions)" (Reardon et al., 2001: 424).

38 Information on market concentration in global agricultural commodity chains is limited. As noted by Murphy (2006: 7): "There is a widely acknowledged need for increased transparency in national and international markets about the scale and diversity of the largest food companies."

39 Deardorff and Rajaraman (2009) suggest that "although the evidence points to oligopsony rather than pure monopsony, it is likely that market segmentation leads to the producers in any single country confronting one rather than more than one buyer." An example of monopsony is the Kabuye sugar factory in Rwanda, which is the only sugar producer in the country (UNCTAD interview with the Kabuye Sugar Works Sarl, Rwanda, in early 2009).

40 Such an "hourglass" situation is responsible for occurrences of market power in agriculture in general (Murphy, 2006: 12).

41 In Côte d'Ivoire, for example, the liberalization of world markets in cocoa in the past few decades has not only resulted in a stronger concentration in downstream parts of the value chain, where a few TNCs form an oligopsony and are engaged in fierce competition, but also in a concentration of buying, resulting in market power over farmers in particular. This situation has been aggravated by the dismantling of State regulatory bodies and marketing boards, which had atomized the supply side. This is despite the fact that Côte d'Ivoire accounts for 40% of world cocoa supplies and should thus be in a position to amass some "selling power" (Dorin, 2008; UNCTAD, 2008d).

42 See, for instance, South Centre (2008: 5): "For commodity exporters, the market concentration has negatively affected their ability to maintain existing markets and penetrate new ones. It is also one of the major reasons for the little share of producers' earnings in final value of commodities. This is clear from the large gap between farm-gate prices that commodity producers receive and retail prices that consumers pay."

43 See also UNCTAD (2006a) for an analysis of concentration in the agricultural input industry and of food clusters.

44 This small share is partly due to the fact that most certified fair trade coffee is sold on the open market and not by fair trade dealers, and therefore does not fetch the fair trade premium.

45 Coffee, for example, undergoes initial stages of processing before the green beans are exported for further processing in consuming countries. In the case of soluble (instant) coffee, all production stages can be done domestically as it has a much longer shelf life (Krüger and Negash, 2009). Another example is tobacco, with the dried tobacco bought from tobacco farmers and then processed and stored in a local plant until it is ready to head off to a cigarette production facility overseas (World Bank, 2003).

46 See MIGA website at: http://www.miga.org/sectors/index_sv.cfm.

47 In some African countries, several sugar projects were launched with the explicit aim of reducing the sugar import bill (e.g. Kibos Sugar and Allied Industries Limited, Kenya, the Companiha de Sena S.A.R.L., Mozambique or the Kenana Sugar Company, Sudan). The latter two projects were also undertaken to increase exports of sugar from the respective countries (see, for example: http://www.miga.org/sectors/index_sv.cfm; Nur, 2009). Biofuels are another generally promising industry involving TNCs. Ethiopia, for instance, is trying to tackle a rising petroleum import bill and improve its energy security by encouraging investments in bio-diesel and bio-ethanol production. Foreign investors from Germany and the United Kingdom have signed up to grow and process Jatropha and castor beans for this purpose (Fessehaie, 2009).

48 With respect to agricultural commodities the following examples highlight this dependence. In Burkina Faso, the share of cotton in exports was 72% in 2004, and in Benin it was 58% in 2005, while tobacco accounted for 49% of Malawi's exports in 2007 and soya for 45% of Paraguay's exports.

49 Dependence on oil and minerals can be extreme: In Nigeria the share of petroleum in its exports was more than 98% in 2006, in Sudan it was 88% and in Gabon 86%. Mali depended on gold for 75% of its exports in 2007, Zambia on copper for 71% and Niger on uranium for 63% (UNCTAD, based on Comtrade data).

50 Another example of diversification and generation of export earnings is the fishing industry in Eritrea that is being built with the help of investors from Italy and the Netherlands (Library of Congress, Federal Research Division, 2005).

51 Some 14% of total GHG emissions have been attributed to agriculture (excluding change in land use), compared with 60% to energy, 18% to deforestation and 4% to industrial processes (World Bank, 2007).

52 Even in manufacturing, in which TNC participation in pollution-intensive activities in host developing countries is relatively high, there is no clear evidence to support the hypothesis that TNCs in general shift the location of their pollution-intensive activities to take advantage of lax environmental standards in host developing countries (*WIR99*).

53 The large banana TNCs based in the United States, which have been controlling plantations in several Latin American countries since the early 1900s, had a reputation for their broad reach and influence (extending, in some cases, to influencing governments, giving rise to the term "banana republic"). This was likely accompanied by a tendency to be closed and defensive in addressing concerns about standards and practices, as acknowledged by the President and CEO of Chiquita in 2000 (Arias et al., 2003).

54 One persistent issue relates to the health impacts of pesticides used in banana plantations. In November 2007, a Los Angeles jury awarded punitive damages to some Nicaraguan workers who suffered adverse effects from exposure to a pesticide containing DBCP used in Dole's plantations ("Los Angeles Jury punishes Dole Foods Company, Inc", *Pesticide News Archive*, November 16, 2007 (www.bananalink.org.uk). More recently, two lawsuits filed against the company in Los Angeles on

behalf of Nicaraguan banana workers with respect to the use of the same pesticide were thrown out by the judge because of fraud (Katherine Glover, "Fraud helps Dole in Nicaragua banana pesticide case", 13 May 2009, http://industry.bnet.com).

55 For example, Ethiopia, Kenya and Uganda in Africa, Colombia and Ecuador in Latin America, and India and Viet Nam in Asia.

56 About 80% of the total income of the horticulture industry in the country is attributed to the 10 leading companies, all foreign owned,56 and about two thirds of flower farms in Kenya are managed by foreign firms (Lans, 2005). See: "Kenya: country's wealth in foreign hands", *African Path*, 30 May 2007.

57 "How Kenya is caught on the thorns of Britain's love affair with the rose", *The Guardian*, 13 February 2006.

58 Both the herbicide glyphosate, and the glyphosate-resistant GM variety of soya are sold by Monsanto (United States), under the names "Roundup" and Roundup Ready", respectively.

59 See, for instance Howard and Dangl, "The multinational beanfield war: soy cultivation spells doom for Paraguayan campesinos" (http://inthesetimes.com).

60 In June 2008, the agreement was extended for another year.

61 See the Round Table on Responsible Soy Association website, at: www.responsiblesoy.org.

62 As stated by Berg et al. (2006: viii), "…for value chain promotion to be pro-poor, it needs to be firmly embedded in direct measures to make resource-poor producers 'linkable' to markets. Without developing necessary physical and institutional infrastructure and human capacities at the micro level, value chain support activities at the meso and macro levels are likely not only to by-pass the poor, but to widen the gap between poor and non-poor."

63 This can be done by women and the community itself, as in the flower cutting industry in Kenya (UNCTAD, 2008e); by the State, as in the case of government programmes in Indonesia and the Philippines (World Bank, FAO and IFAD, 2009b); or by TNCs, such as through the partnership between the United Nations Development Programme (UNDP), Nestlé Pakistan and Engro Food (Nestlé, 2008). In the last case, through a partnership between UNDP, Nestlé Pakistan and Engro Food, 4000 women were trained in Pakistan to act as farm consultants, dispensing technical advice about milk production to 85,000 farmers (Nestlé, 2008).

64 Or indeed domestic companies, because whether this effect is TNC-specific depends on context (e.g. there may be no local companies capable of undertaking the relevant activities).

65 For example, for visiting family and friends, attending school, accessing medical facilities, or going to work.

66 Closely linked to this issue are water rights, which are not treated separately here (see, for instance, UNESCO, 2009)

67 This situation can be worsened, for example by price rises resulting from demand for alternative uses for food crops, as in some cases of recent diversion to biofuel use, although such a situation is unlikely to persist (FAO, 2008c; von Grebmer et al., 2008).

68 At least in the short run. TNCs will normally have access to the hard currency needed to pay for imports.